



**US Army Corps  
of Engineers®**

RFP No. DACA67-02-R-0204

Seattle District

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# **Improve Capehart Family Housing Phase 3**

**Malmstrom AFB, MT**

## **Construction Solicitation and Specifications**

**January 2002**

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THIS PROCUREMENT IS:

## Open to both Large and Small Business

### Malmstrom Air Force Base

SITE VISIT: Great Falls, Montana, BLDG 1240, Education Center

A one time Pre-proposal Conference is scheduled 6 February 2002 at 09:30 a.m., local Great Falls time at Malmstrom Air Force Base, Great Falls, Montana, Education Center, Bldg 1240 (4<sup>th</sup> avenue and 75<sup>th</sup> Street), Room number 102. A site visit will follow the Pre-proposal conference (if required) will be held at Room 101 of the Education Center.

Offerors are urged and expected to inspect the site where construction is to be performed and to satisfy themselves as to all general and local conditions which may affect the cost of performance of the contract, to the extent such information is reasonably obtainable. In no event, will a failure to inspect the site constitute grounds for withdrawal of a bid opening or for a claim after award of the contract.

**Anyone interested in attending the Pre-Proposal Conference and site visit must contact Carolyn Brown, (Also emergency contact person), (406) 771-0092 or email [carolyn.r.brown@nws02.usace.army.mil](mailto:carolyn.r.brown@nws02.usace.army.mil) to arrange for bus service at the main gate to take visitors to the meeting location and provide transportation to and from the physical project location: All visitors with vehicles must leave their cars at the main gate, southwest parking area. (Do not park in the visitor pass parking area). Individual gate pass will be required due to security requirements. Each person must have a valid driver's license or picture ID. Please arrive by 8:00 a.m. to insure boarding of the bus. If necessary, a lunch break will be from 11:50 a.m. to 1:15 p.m.**

**FOR INQUIRIES, CONTACT THE FOLLOWING INDIVIDUALS** Monday through Friday between the hours of 7: 00 a.m. and 4:00 p.m.:

Contact via the following Internet address: [techbid@nws02.usace.army.mil](mailto:techbid@nws02.usace.army.mil)

OFFERORS DOCUMENTS: Register for solicitations at the Internet site: <http://www.nws.usace.army.mil/ct/>

PLANHOLDER'S LISTS: Lists may also be obtained from the same site

ADMINISTRATIVE MATTERS: Nancy A. Gary

Phone: 206 764-3266

FAX: 206 764-6817

Internet: [nancy.a.gary@usace.army.mil](mailto:nancy.a.gary@usace.army.mil)

All individuals are at the following mailing and street addresses:

(Mail) Seattle District Corps of Engineers, PO Box 3755, Seattle, WA 98124-3755

(Street) 4735 E marginal Way S., Seattle, WA 98134-2385

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### CAUTION TO OFFERORS

<u>SECTION</u>	<u>TITLE</u>
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SF1442 - Pages 00010-1 thru 00010-6 (00010-3 is reserved for use at a later time) & Subcontracting Plan Pages 00010-7 thru 0010-13	
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00100	Instructions, Conditions and Notice to Offerors
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00600	Representations and Certifications and other Statements of Offerors, and Pre-Award Information
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00700	Contract Clauses
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00800	Special Clauses, which include the following:
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- a) Special Clauses      Pages 00800-1 thru 00800-18**
- b) Davis-Bacon General Wage Decision No. MT010026**

01000	Technical Specifications
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- a)01001 thru 16722**
- b)Appendix A: Inspection Report of Asbestos and Lead-Based Painted  
Building Materials – Capehart Family Housing Improvements, Phase 3**

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## **!!CAUTION TO OFFERORS !!**

1. **TELEPHONES:** Limited telephone service is provided in the lobby. Only two public telephones may be used by offerors for completing offers.
2. **BUSINESS HOURS:** For the Seattle District Corps of Engineers are from 7:30 A.M. to 4:00 P.M., Monday through Friday.
3. **AVAILABILITY OF FUNDS:** Funds are not presently available for this acquisition. No contract award will be made until appropriated funds are made available from which payment for contract purposes can be made.

**BEFORE SIGNING AND MAILING THIS OFFER, PLEASE TAKE NOTE OF THE FOLLOWING, AS FAILURE TO PERFORM ANY ONE OF THESE ACTIONS MAY CAUSE YOUR OFFER TO BE REJECTED**

4. **AMENDMENTS:** Have you acknowledged receipt of ALL amendments? If in doubt as to the number of amendments issued, please contact the Plans Room representative listed on the Information Page.
5. **AMENDED PAGES:** If any of the amendments furnished amended pages, the amended pages must be used in submitting your offer.
6. **MISTAKE IN OFFER:** Have you reviewed your offer price for possible errors in calculation or work left out?
7. **TELEGRAPHIC MODIFICATIONS:** The Seattle District does not have the capability of receiving commercial telegrams directly. Offerors who wish to modify their offer by telegram are urged to ensure that telegrams are submitted within enough time to arrive at the opening office prior to the time specified for receipt of proposals. Any doubt as to time should be resolved in favor of EXTRA TIME. Transmission by Fax to this office is NOT ACCEPTABLE.
8. **OFFER ACCEPTANCE PERIOD:** The minimum offer acceptance period is specified in block 13D of SF1442-1, Solicitation, Offer and Award. Please ensure that you allow at least the stated number of calendar days for the Government to accept your offer.
9. **CENTRAL CONTRACTOR REGISTRATION:** Your attention is drawn to DFARS Clause 252.204-7004, REQUIRED CENTRAL CONTRACTOR REGISTRATION in section 00100. Lack of registration in the CCR database will make offeror ineligible for award. Information on how to register and the time it takes are detailed in the clause.
10. **HUBZONE CERTIFICATION:** Your attention is drawn to FAR Clause 52.219-4, NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (JAN 1999) in section 0600. A HUBZone small business concern, as used in this clause, means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration **Reference:** <https://el.sba.gov:9000/prodhubzone/hubzone/approval.stm>

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<b>SOLICITATION, OFFER, AND AWARD</b> <i>(Construction, Alteration, or Repair)</i>	1. SOLICITATION NUMBER  DACA67-02-R-0204	2. TYPE OF SOLICITATION  <input type="checkbox"/> SEALED BID (IFB) <input checked="" type="checkbox"/> NEGOTIATED (RFP)	3. DATE ISSUED  18 January 2002	PAGE OF PAGES
	<b>IMPORTANT - The "offer" section on the reverse must be fully completed by the offeror.</b>			
4. CONTRACT NUMBER	5. REQUISITION/PURCHASE REQUEST NUMBER W68MD9-1228-1347	6. PROJECT NUMBER		
7. ISSUED BY  Seattle District, Corps of Engineers ATTN: CENWS-CT-PR PO Box 3755 Seattle, WA 98124-3755	CODE W68MD9	8. ADDRESS OFFER TO  Seattle District, Corps of Engineers PO Box 3755 ATTN: CENWS-CT-CB-MU Seattle, WA 98124-3755  HAND CARRY: Seattle District Corps of Engineers Contracting Division 4735 East Marginal Way South Seattle, WA 98134-2385		
9. FOR INFORMATION CALL 	A. NAME See Information Page inside Front Cover	B. TELEPHONE NUMBER (Include area code) (NO COLLECT CALLS) See Information Page inside Front Cover		

**SOLICITATION**

**NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".**

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS (Title, identifying number, date):

Furnish all labor, materials and equipment and perform all work for Improve (ing) Capehart Family Housing Phase 3, Malmstrom AFB, MT in accordance with the attached Contract Clauses, Special Clauses, Technical Specifications and Drawings.

NOTE: Award will be made pursuant to the Small Business Competitive Development Program

11. The Contractor shall begin performance within <u>10</u> calendar days and complete it _____ calendar days after  <input type="checkbox"/> award, <input checked="" type="checkbox"/> notice to proceed. This performance period is <input type="checkbox"/> mandatory, <input checked="" type="checkbox"/> negotiable. (See *Paragraph SC-1, 00800 .)	
12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE PAYMENT BONDS? (If "YES," indicate within how many calendar days after award in Item 12B.)  <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	12B. CALENDAR DAYS  10
13. ADDITIONAL SOLICITATION REQUIREMENTS:	
A. Sealed offers in original and <u>0</u> copies to perform the work required are due at the place specified in Item 8 <u>9:30 a.m</u> (hour) local time <u>6 February 200</u> (date). If this is a sealed bid solicitation, offers will be publicly opened at that time. Sealed containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.	
B. An offer guarantee <input checked="" type="checkbox"/> is, <input type="checkbox"/> is not required.	
C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by	
D. Offers providing less than <u>120</u> calendar days for Government acceptance after the date offers are due will not be considered and be rejected.	

**OFFER (Must be fully completed by offeror)**

14. NAME AND ADDRESS OF OFFEROR <i>(Include ZIP Code)</i>   <div style="display: flex; justify-content: space-between;"> <span>Tax ID No:</span> <span>DUNS No:</span> </div> <div style="display: flex; justify-content: space-between;"> <span>eMail:</span> <span></span> </div> <div style="display: flex; justify-content: space-between;"> <span>CODE</span> <span>FACILITY CODE</span> </div>	15. TELEPHONE NUMBER <i>(Include area code)</i> <div style="text-align: right;">Fax No.:</div> <hr/> 16. REMITTANCE ADDRESS <i>(Include only if different than Item 14)</i>
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17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this accepted by the Government in writing within \_\_\_\_\_ calendar days after the date offers are due. *(Insert any number equal or greater than minimum requirement stated in 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)*

AMOUNTS



See Page 00010-5 and 00010-6

18. The offeror agrees to furnish any required performance and payment bonds.

**19. ACKNOWLEDGEMENT OF AMENDMENTS**

*(The offeror acknowledges receipt of amendments to the solicitation - give number and date of each)*

AMENDMENT NO.									
DATE									

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER <i>(Type or print)</i>	20B. SIGNATURE	20C. OFFER DATE
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**AWARD (To be completed by Government)**

21. ITEMS ACCEPTED

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA
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24. SUBMIT INVOICES TO ADDRESS SHOWN IN <i>(4 copies unless otherwise specified)</i>	ITEM 26	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO <input type="checkbox"/> 10 U.S.C. 2304(c) ( ) <input type="checkbox"/> 41 U.S.C. 253(c) ( )
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26. ADMINISTERED BY Spokane Area Office USAE, Seattle PO Box 1929 Airway Heights, WA 99001-1929	CODE	27. PAYMENT WILL BE MADE BY US Army Corps of Engineers Finance Center CEFC-AO-P 5722 Integrity Drive Millington, TN 38054-5005
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**CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE**

<input type="checkbox"/> 28. NEGOTIATED AGREEMENT <i>(Contractor is required to sign document and return _____ copies to the issuing office.)</i> Contractor agrees to furnish and deliver all items or perform all work requirements identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications incorporated by reference in or attached to this	<input type="checkbox"/> 29. AWARD. <i>(Contractor is not required to sign this document.)</i> offer on this solicitation is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.
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30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN <i>(Type or print)</i>	31A. NAME OF CONTRACTING OFFICER <i>(Type or print)</i>		
30B. SIGNATURE	30C. DATE	31B. UNITED STATES OF AMERICA  BY	31C. AWARD DATE

**Submit Invoices as follows:**

Submit 1 Copies of Invoice to:

Malmstrom AFB Resident Office  
Spokane Area Office  
USAE, Seattle  
PO BOX 1929  
Airway Heights WA 99001-1929

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IF THE CONTRACTOR IS A CORPORATION OR PARTNERSHIP, THE APPLICABLE PORTION OF THE FORM LISTED BELOW MUST BE COMPLETED. IN THE ALTERNATIVE, OTHER EVIDENCE MUST BE SUBMITTED TO SUBSTANTIATE THE AUTHORITY OF THE PERSON SIGNING THE CONTRACT. IF A CORPORATION, THE SAME OFFICER SHALL NOT EXECUTE BOTH THE CONTRACT AND THE CERTIFICATE.

CORPORATE CERTIFICATE

I, \_\_\_\_\_, certify that I am the \_\_\_\_\_ Secretary of the Corporation named as Contractor herein; that \_\_\_\_\_, who signed this contract on behalf of the Contractor was then \_\_\_\_\_ of said corporation; that said contract was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

\_\_\_\_\_  
(Secretary) (CORPORATE SEAL)

AUTHORITY TO BIND PARTNERSHIP

This is to certify that the names, signatures and Social Security Numbers of all partners are listed below and that the person signing the contract has authority actually to bind the partnership pursuant to its partnership agreements. Each of the partners individually has full authority to enter into and execute contractual instruments on behalf of said partnership with the United States of America, except as follows: (state "none" or describe limitations, if any)

\_\_\_\_\_

This authority shall remain in full force and effect until such time as the revocation of authority by any cause whatsoever has been furnished in writing to, and acknowledged by, the Contracting Officer.

(Names, Signatures and Social Security Numbers of all Partners)

NAME	SIGNATURE	SOCIAL SECURITY NO.
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

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**SCHEDULE**

<u>Item No.</u>	<u>Description of Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Amount</u>
BASE ITEMS					
0001	Provide all Labor, Materials, Equipment, and Transportation to Complete Demolition and Renovation, Including All Site Utilities (such as gas, water, power, etc.) within a line 5 Feet outside the Building Walls, and a Survey of Demolition Work Required, at Buildings 4009 through 4016, 4029, 4030 and 4031, Inclusive, Except for Items 0007, 0008, 0009, 0010, 0011, 0012, 0013 and 0014	1	JOB	L.S.	\$_____
0002	Provide all Labor, Materials, Equipment, and Transportation for Tot Lot and Adjacent Areas Within 10 Feet of Buildings 4027 and 4028	1	JOB	L.S.	\$_____
<b>TOTAL BASE ITEMS</b>					<b>\$_____</b>
OPTIONAL ITEMS					
0003	Provide all Labor, Materials, Equipment, and Transportation for All Site Utilities (such as gas, water, power, etc.) outside a line 5 Feet outside the Building Walls	1	JOB	L.S.	\$_____
0004	Provide all Labor, Materials, Equipment, and Transportation for Renovation of Type A3 Building 4025, Except for Items 0007 and 0011	1	JOB	L.S.	\$_____
0005	Provide all Labor, Materials, Equipment, and Transportation for Renovation of Type B1 Buildings 4018, 4021, 4022, 4023, 4024, 4026, 4027 and 4028, Including All Site Utilities (such as gas, water, power, etc.) within a line 5 Feet outside the Building Walls, Except for Items 0008 and 0012	NTE 8	Bldg	\$_____	NTE \$_____
0006	Provide all Labor, Materials, Equipment, and Transportation for Renovation of Type B2 Buildings 4017, 4019 and 4020, Including All Site Utilities (such as gas, water, power, etc.) within a line 5 Feet outside the Building Walls, Except for Items 0009 and 0013	NTE 3	Bldg	\$_____	NTE \$_____
0007	Provide all Labor, Materials, Equipment, and Transportation to Reroof Type A3 Buildings 4015 and 4025	NTE 2	Bldg	\$_____	NTE \$_____

02009/DJ  
 Improve Capehart Family Housing, Malmstrom AFB, Montana

Item No.	Description of Item	Quantity	Unit	Unit Price	Amount
0008	Provide all Labor, Materials, Equipment, and Transportation to Reroof Type B1 Buildings 4010, 4013, 4016, 4018, 4021, 4022, 4023, 4024, 4026, 4027, 4028 and 4029	NTE 12	Bldg	\$_____	NTE \$_____
0009	Provide all Labor, Materials, Equipment, and Transportation to Reroof Type B2 Buildings 4012, 4014, 4017, 4019, 4020 and 4030	NTE 6	Bldg	\$_____	NTE \$_____
0010	Provide all Labor, Materials, Equipment, and Transportation to Reroof Type B3 Buildings 4009, 4011 and 4031	NTE 3	Bldg	\$_____	NTE \$_____
0011	Provide all Labor, Materials, Equipment, and Transportation for Basements at Type A3 Buildings 4015 and 4025	NTE 2	Bldg	\$_____	NTE \$_____
0012	Provide all Labor, Materials, Equipment, and Transportation for Basements at Type B1 Buildings 4010, 4013, 4016, 4018, 4021, 4022, 4023, 4024, 4026, 4027, 4028 and 4029	NTE 12	Bldg	\$_____	NTE \$_____
0013	Provide all Labor, Materials, Equipment, and Transportation for Basements at Type B2 Buildings 4012, 4014, 4017, 4019, 4020 and 4030	NTE 6	Bldg	\$_____	NTE \$_____
0014	Provide all Labor, Materials, Equipment, and Transportation for Basements at Type B3 Buildings 4009, 4011 and 4031	NTE 3	Bldg	\$_____	NTE \$_____
<b>TOTAL OPTIONAL ITEMS</b>				<b>NTE \$_____</b>	
<b>TOTAL BASE AND OPTIONAL ITEMS</b>				<b>NTE \$_____</b>	



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**SEATTLE DISTRICT, CORPS OF ENGINEERS**  
**P.O. BOX 3755**  
**SEATTLE, WASHINGTON 98124-3755**

**13 December 2001**

Contracting Division

SUBJECT: DACA67-02-R-0204, Improve Capehart Family Housing Phase 3, Malmstrom AFB, MT

**NOTICE TO LARGE BUSINESS FIRMS: (RFP)**

Your attention is directed to the contract clauses entitled "Utilization of Small Business Concerns (Oct 2000) (52.219-0008) and "Small Business Subcontracting Plan" (Oct 2000) (52.219-0009II), which are included in this solicitation. If you are a large business, and your offer is **\$1,000,000** or you are required to submit a subcontracting plan **with** your proposal. Award will not be made under this solicitation without a subcontracting plan approved by the Contracting Officer.

**DEFINITIONS:** "Subcontract" means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime contractor or subcontractor calling for supplies and/or services required for performance of the contract or subcontract.

For your information, we consider the following goals reasonable and achievable during the performance of the contract resulting from this solicitation. However, final goals will be negotiated prior to contract award. The Subcontracting Plan will then become a material part of your contract.

- a. 60% of planned subcontracting dollars can be placed with all small business concerns.
- b. 2 % of planned subcontracting dollars may be placed with HUBZone small business concerns. NOTE: b is a subset of a.

**Only small disadvantaged businesses (SDB) firms must be certified by the U.S. Small Business Administration** in addition to meeting the definition under FAR clause 52.219-8(c)(3))

- c. 9% of planned subcontracting dollars can be placed with those small business concerns owned and controlled by socially and economically disadvantaged individuals or Historically Black Colleges and Universities or Minority Institutions. NOTE: c. is a subset of a.
- d. 5% of planned subcontracting dollars for small women-owned businesses. NOTE: d. is a subset of a. Also, the women-owned business may meet the definition of a small disadvantaged business. If so, c. will also be a subset of b.
- e. 3% of planned subcontracting dollars for veteran-owned small business. NOTE: e. is a subset of a. *Be advised that your company must also track subcontract awards to Service Disabled Veteran-owned Small Business concerns.*

Goals included in any proposed plan submitted by you should be at least equal to the ones we are recommending. If lesser goals are proposed, you will have to explain how those goals and your plan represent your best efforts to comply with the policy outlined in the contract clauses. There are a number of equally important aspects of the plan. You should familiarize yourself with the requirements set forth in the contract clauses relating to the subcontracting plan before submitting a proposal.

Your plan will be reviewed and scored in accordance with AFARS 19.705-4(d) to ensure it clearly represents your firm's ability to carry out the terms and conditions set forth in the contract clauses. A Subcontracting Plan with a score of less than 70 may not be accepted. It is recommended that your small business program reflect, as a minimum, what is described in the attached example which can be used as a guide. The example is intended to

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assist you in developing your own subcontracting plan/program. Delete the instructions shown in parenthesis or your small business program will not be approved. If discussions during this review raise doubts as to your intentions or ability to comply with these contractual obligations, it could result in your disqualification for award.

Your plan must address how you will maximize subcontracting opportunities with the small business communities to be found within the project locations. Demonstrated outreach efforts through conference attendance, use of ProNet, Corporate support of your Small Business Program Liaison Officer and Small Business Program must be addressed in your subcontracting plan.

Your Small Business Program Managers' attendance at DOD Regional Council Meetings for Small Business Education and Advocacy will be a contract requirement. **DOD Policy Guidance:** In accordance with the Small Business Act, it is the policy of the federal government to aid, assist, and counsel small business to ensure that a fair share of contracts are awarded to small business. Consistent with this, it is the policy of DOD to sponsor regional councils as one significant way to aid, assist, and counsel small business through education and advocacy *of its members who are charged with the responsibility of fulfilling this federal policy.* Therefore, be advised that the individual listed in paragraph 7 of the example will be required to attend these regional council meetings and that attendance must be addressed in your subcontracting plan. Contact at (425) 889-7318 for information relating to upcoming training opportunities. Your plan must be submitted with your price proposal.

Should you have any questions or need assistance in DEVELOPING YOUR SUBCONTRACTING PLAN please call the undersigned at (206) 764-6807. If you need TECHNICAL ASSISTANCE call Nancy Gary at (206) 764-3266.

Enclosure

Sincerely,



Cheryl A. Anderson  
Acting Deputy for Small Business

**NOTE: This is an example plan.** If you use this example as a guide you must delete all the instructions shown in (parenthesis), including this message, or your plan will be returned.

SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED  
SMALL BUSINESS SUBCONTRACTING PLAN

DATE: \_\_\_\_\_.

CONTRACTOR:  
ADDRESS:  
PHONE NO:

PROJECT TITLE:  
SOLICITATION NO:

1. In accordance with the contract clauses at 52.219-8 and 52.219-9, (name of contractor) submits the following Subcontracting Plan for Small, Small Disadvantaged, and Women-owned Business Concerns.

2. Corresponding dollar values for percentages cited in para. 3 for the base period only:

- a. Total contract amount is \$\_\_\_\_\_.
- b. Total dollars planned to be subcontracted (to all types of businesses): \$\_\_\_\_\_.
- c. Total dollars planned to be subcontracted to small business concerns (including 2d, 2e, 2f, and 2g below):  
\$\_\_\_\_\_.
- d. Total dollars planned to be subcontracted to HUBZone small business: \$\_\_\_\_\_.
- e. Total dollars planned to be subcontracted to small disadvantaged business concerns: \$\_\_\_\_\_.
- f. Total dollars planned to be subcontracted to small woman-owned business concerns: \$\_\_\_\_\_.
- g. Total dollars planned to be subcontracted to veteran-owned small business concerns \$\_\_\_\_\_.

Included in this amount are subcontracting opportunities for service-disabled veteran-owned small business concerns.

3. The following percentage goals (expressed in terms of a percentage of total planned subcontracting dollars) are applicable to the contract awarded under the solicitation cited above.

a. Small Business Concerns (2c divided by 2b): \_\_\_\_\_% of total planned subcontracting dollars under this contract will go to subcontractors who are small business concerns including 3c through 3e.

b. Small HUBZone Business Concerns (2d divided by 2b): \_\_\_\_\_% of total planned subcontracting dollars under this contract will go to subcontractors who are HUBZone small business contractors. (SEE the definition in contract clause 52.219-8(c) or use the internet: <http://www.sba.gov/hubzone/> for further information.)

c. Small Disadvantaged Business Concerns (2e divided by 2b): \_\_\_\_\_% of total planned subcontracting dollars under this contract will go to subcontractors who are small disadvantaged individuals. (**NOTE: On solicitations issued after October 1, 1999 SDB firms must be certified** and meet the definition under clause 52.219-8(c)(3)).

d. Small Woman-Owned Business Concerns (2f divided by 2b): \_\_\_\_\_% of total planned subcontracting dollars under this contract will go to subcontractors who are small woman-owned businesses.

e. Veteran-owned small business concerns (2g divided by 2b): \_\_\_\_\_% of total planned subcontracting dollars under this contract will go to subcontractors who are veteran-owned small businesses and/or service-disabled veteran-owned small business concerns.

4. The principal items or areas we will subcontract under this contract are:

a. Of the items or areas stated in 4; the following are planned to be subcontracted to Small Businesses (LIST THE NAME AND RESPONSIBILITY OF FIRM):

b. Of the items or areas stated in 4.a; the following are planned to be subcontracted to HUBZone small business concerns (LIST THE NAME AND RESPONSIBILITY OF FIRM):

c. Of the items or areas stated in 4.a; the following are planned to be subcontracted to Small Disadvantaged Businesses (LIST THE NAME AND RESPONSIBILITY OF FIRM):

d. Of the items or areas stated in 4.a; the following are planned to be subcontracted to Small Women-Owned Businesses (LIST THE NAME AND RESPONSIBILITY OF FIRM):

e. Of the items or areas stated in 4.a; the following are planned to be subcontracted to Veteran-owned Small Businesses and/or service-disabled veteran-owned small business concerns (LIST THE NAME AND RESPONSIBILITY OF FIRM):

**\*\*NOTE: SEE LAST PAGE IF THIS SOLICITATION HAS OPTION YEARS OR PERIODS (DELETE THIS STATEMENT FROM YOUR PLAN)\*\***

5. Provide a description of the method your firm used to develop the subcontracting goals in paragraph 3:

6. Indirect costs were ( ) were not ( ) used in establishing subcontracting goals. \*\*If indirect costs are included in your goals, furnish a description of the method used to determine the proportionate share of indirect costs to be incurred with (i) small business concerns (ii) HUBZone small business concerns (iii) small disadvantaged business concerns (iv) women-owned and (v) Veteran-owned small business concerns\*\*

7. The following individual will administer (name of contractor) Subcontracting Program:

**(NOTE TO OFFERORS: The individual named here will be expected to perform and manage your plan and contract clause 52.219-9). Site Construction project managers may not be acceptable as your small business advocate that manages your Corporate Small Business Program).**

Name: \_\_\_\_\_ Job Title: \_\_\_\_\_

Address and Telephone Number: \_\_\_\_\_

This individual's specific duties with regard to the conduct of our firm's Subcontracting Plan will include, but will not be limited to, the following:

a. Developing and maintaining bidders lists of small business, HUBZone small business, small disadvantaged business and women-owned small business concerns using sources such as the Small Business Administration's ProNet (<http://pro-net.sba.gov/>) Washington State Office of Minority and Women-owned Business Enterprises (<http://www.wsdot.wa.gov/omwbe/>) Minority Business Development Agency, US Department of Commerce, Local Minority Business Development Centers, Economic Development Centers, and National Center for American Indian Enterprise Development.

b. Assuring the inclusion of small business, HUBZone small business, small disadvantaged, women-owned small business, and veteran owned small business concerns in all solicitations for products or services which they are capable of providing; and ensuring that all solicitations are structured to permit the maximum possible participation by small, small disadvantaged and women-owned small business concerns.

c. Establishing and maintaining records of all solicitations and subcontract awards to ensure that the members of the firm who review bidders proposals documents their reasons for selecting or not selecting a bid submitted by a small business, HUBZone small business, small disadvantaged business, women-owned small business or veteran-owned small business concern, and monitoring the firm's progress towards achievement of its percentage goals.

d. Preparing and submitting the Subcontracting Report for Individual Contracts (SF 294) and the Summary Subcontract Report (SF 295) in accordance with instructions provided, and coordinating and preparing for all compliance reviews by Federal agencies.

e. Attendance at DOD sponsored training programs in order to develop guidance and training to firm personnel on the policy of the federal government to aid, assist, and counsel small business under this and other government contracts.

f. Conducting or arranging for all other activities necessary to further the intent and attainment of the goals in the Plan to include motivational training of the firm's purchasing personnel, attendance at workshops, seminars and trade fairs conducted by or on behalf of small business, HUBZone small business, and/or small disadvantaged and/or women-owned small business and/or Veteran-owned small business concerns; and general cooperation with members of the small, small disadvantaged, small women-owned, and veteran owned small business concerns or their representatives.

8. The following steps will be taken to ensure that small business, small HUBZone small business, small disadvantaged business, women-owned small business, and veteran-owned small business concerns receive notice of and have an equitable opportunity to compete for intended awards of subcontracts and/or purchase orders for the products and/or services describe in paragraph 4 above:

a. Sources will be requested through SBA's ProNet system, business development organizations, minority and small business trade associations and at small, minority, veteran small business and women-owned small business procurement conferences; sources will be contacted; and bidding materials will be provided to all responding parties expressing an interest.

b. Internally, motivational training will be conducted to guide and encourage purchasing personnel; source lists and guides to small business, HUBZone small business, small disadvantaged, women-owned small business, and veteran-owned small business concerns will be maintained and utilized by purchasing personnel while soliciting subcontracts and purchase orders; activities will be monitored to ensure sufficient time is allowed for interested bidders to prepare their proposals and to evaluate continuing compliance with the Subcontracting Plan.

9. [Name of contractor] agrees that the clause entitled "Utilization of Small Business Concerns" (Oct 2000) will be included in all subcontracts that offer further subcontracting opportunities. All subcontractors, except small business concerns, who receive subcontracts in excess of \$500,000 (\$1,000,000 in the case of construction) will be required to adopt a subcontracting plan that complies with the requirements of this clause. Such plans will be reviewed to assure that all minimum requirements of an acceptable subcontracting plan have been satisfied.

The acceptability of percentaged goals shall be determined on a case-by-case basis depending on the supplies/services involved, the availability of potential small business, HUBZone small business, small disadvantaged, women-owned and veteran-owned subcontractors, and prior experience. Once approved and implemented, plans will be monitored through the submission of periodic reports and, as time and availability of funds permit, periodic visits to subcontractors facilities to review applicable records and subcontracting program progress.

10. (Name of contractor) agrees to submit such periodic reports and cooperate in any studies or surveys as may be required by the Contracting agency or Small Business Administration in order to determine the extent of compliance by the offeror with the subcontracting plan and with the clause entitled "Utilization of Small Business Concerns" contained in the contract.

11. (Name of Contractor) agrees to maintain at least the following types of records to document compliance with the Subcontracting Plan:

a. The names of all organizations, agencies, and associations contacted for small business, HUBZone small business, small disadvantaged, women-owned small business sources, and veteran-owned small business along with records of attendance at conferences, seminars and trade fairs where additional sources were developed.

b. Source lists, guides, and other data identifying small business, HUBZone small business, small disadvantaged, women-owned and veteran-owned small business subcontractors and vendors.

c. Records on all subcontract solicitations resulting in an award of more than \$100,000 on a contract-by-contract basis, indicating (1) whether small business concerns were solicited, and if not, why not; (2) whether HUBZone small business were solicited, and if not, why not; (3) whether small disadvantaged business concerns were solicited, and if not, why not; (4) whether small women-owned business concerns were solicited, and if not, why not; (5) whether veteran-owned small business concerns were solicited, and if not, why not; and (6) reasons for the failure of solicited small, small disadvantaged, small women-owned and veteran-owned small business concerns to receive a subcontract award.

d. Records of all subcontract award data to include subcontractor's name and address, to be kept on a contract-by-contract basis.

e. Minutes of internal motivational and training meetings held for the guidance and encouragement of purchasing personnel, and records of all monitoring activities performed for compliance evaluation.

f. Copies of SF 294 and SF 295 showing date and place of filing and copies of all other reports or results of reviews conducted by the contracting agency or other interested agencies of the Federal government to monitor our compliance with this Subcontracting Plan.

12. (Name of Contractor) will submit a SF 295, Summary Subcontract Report, on Corps of Engineers projects only. The SF 295 shall be completed and distributed in accordance with the Corps of Engineers Supplemental Instructions. (Name of Contractor) will not report Corps of Engineers projects through any other Agency unless authorized by the Contracting Officer.

13. In closing, (Name of contractor) states that it will be the policy of (Name of contractor) to afford every practicable opportunity for small business, HUBZone small business, small disadvantaged business, small women-owned and veteran-owned small business concerns to participate in contracts awarded to (Name of contractor) by the Federal Government, to ensure that equitable opportunity is provided to small business, HUBZone small business, small disadvantaged business, women-owned and veteran-owned small business concerns to compete for award of subcontracts and purchase orders, and to diligently pursue the achievement of our goals of participation by small business, HUBZone small business, small disadvantaged business, women-owned and veteran-owned small businesses in the dollars available for subcontract/purchase order awards under this contract.

BY: \_\_\_\_\_

\_\_\_\_\_  
Signature and Title of CEO  
Company Name

Date: \_\_\_\_\_

**NOTE:** This solicitation has options (or option periods) , the plan must contain separate goals for **each** option period year. Include EXAMPLE:

	<u>Dollars</u>	<u>Percentage</u>
1. Optional Yr_____total:	\$_____	_____
2. Total to be subcontracted to all types of businesses:	\$_____	_____
a. Subcontracted to Small Business (including b, c, d, and e below):	\$_____	_____
b. Subcontracted to HUBZone Small Businesses:	\$_____	_____
c. Subcontracted to Small Disadvantaged Businesses:	\$_____	_____
d. Subcontracted to Women- Owned Small Businesses:	\$_____	_____
e. Subcontracted to Veteran-owned Small Business:	\$_____	_____
1. Optional Yr_____total:	\$_____	_____
2. Total to be subcontracted to all types of businesses:	\$_____	_____
a. Subcontracted to Small Business (including b, c, d, and e below):	\$_____	_____
b. Subcontracted to HUBZone Small Businesses:	\$_____	_____
c. Subcontracted to Small Disadvantaged Businesses:	\$_____	_____
d. Subcontracted to Women- Owned Small Businesses:	\$_____	_____
e. Subcontracted to Veteran-owned Small Business:	\$_____	_____

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**INTRODUCTION TO SECTION 00100  
INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS**

**1. INTRODUCTION.**

**1.1.** Your firm is invited to submit a proposal for the project entitled "Improve Capehart Family Housing Phase 3, Malmstrom AFB, Montana". Prospective offerors are required to prepare and submit proposals that will be evaluated in accordance with this section of the solicitation.

**1.2. Project Description.** Project consists of renovation of forty-six (46) architecturally identical units (23 duplexes) of family housing. Buildings are 1940's wood frame construction, clustered together in a close neighborhood situation. The work will be done in two phases: (1) Renovation of eleven existing partially renovated duplex structures presently tarped and protected (winterized), and (2) Renovation of remaining duplex structures which are intact. Renovation will include replacement of all interior finishes, appliances, carpeting, cabinets, hardware, electrical and HVAC systems, and associated site utilities, landscaping and playground. Renovation will also include asbestos and lead base paint abatement. Optional work will include the addition of basements to all units.

**1.3. Evaluation and Award.** A firm fixed-price contract will be awarded to one firm submitting the proposal that: a) conforms to this request for proposals (RFP), b) is considered to offer the best value to the Government in terms of the evaluation factors, including price, and c) is determined to be in the best interest of the Government. To be considered for award, proposals shall conform to the terms and conditions contained in the Request For Proposal. No proposal shall be accepted that does not address all criteria specified in this solicitation or which includes stipulations or qualifying conditions. The evaluation process used to determine the most advantageous offer for the technical criteria is described in the following paragraphs.

**2. EVALUATION FACTORS.** Proposals will be evaluated on the basis of two factors, TECHNICAL and PRICE.

**2.1. Technical Evaluation Criteria.** Criteria are listed in descending order of Importance, and are comparatively equal in importance, except for Small & Small Disadvantaged Business Participation, which is significantly less important than the other criteria. Comparatively equal means the criterion is at least one and one-half (1.5) times greater in value than the preceding criterion, but not of an equal value. Significantly less important means the criterion is at least three times lower in value than the other criteria.

- Experience
- Past Performance

- Qualifications
- Schedule
- Organizational Structure
- Extent of Small and Small Disadvantaged Business Participation

**2.2, Price.** Price is reviewed for reasonableness, but not rated. Financial capacity and bonding ability will be checked for responsibility during preaward survey, but not rated.

**3. EVALUATION STANDARDS OF TECHNICAL CRITERIA.** Technical evaluation criteria will be rated using the following adjectival descriptions. Evaluators will apply the appropriate adjective to each criterion rated.

**3.1. OUTSTANDING.** The proposal **fully meets** all minimum performance, capability or qualifications standards required by the RFP **and exceeds many** of the requirements. Information submitted demonstrates offeror's potential to significantly exceed performance or capability standards. The offeror has clearly demonstrated an understanding of all aspects of the requirements to the extent that timely and highest quality performance is anticipated. Has exceptional strengths that will significantly benefit the Government. The offeror's qualifications met the fullest expectations of the Government. The offeror has convincingly demonstrated that the RFP requirements have been analyzed, evaluated, and synthesized into approaches, plans, and techniques that, when implemented, should result in outstanding, effective, efficient, and economical performance under the contract. An assigned rating within "outstanding" indicates that, in terms of the specific factor (or subfactor), the submittal very significantly exceeds most or all solicitation requirements. **VERY HIGH PROBABILITY OF SUCCESS.**

**3.2. ABOVE AVERAGE.** The proposal **meets all** of the minimum performance, capability or qualifications standards required by the RFP **and exceeds some** of them. Has one or more strengths that will benefit the Government. The offeror's qualifications are adequately responsive. Information submitted demonstrates offeror's potential to exceed performance or capability standards. Has one or more strengths that will benefit the Government. The areas in which the offeror exceeds the requirements are anticipated to result in a high level of efficiency or productivity or quality. The submittal contains excellent features that will likely produce results very beneficial to the Government. . Response exceeds a "Satisfactory" rating. **HIGH PROBABILITY OF SUCCESS.**

**3.3. SATISFACTORY (NEUTRAL).** Proposal **meets all** of the minimum performance, capability or qualifications standards required by the RFP with few or no advantages or strengths. Equates to Neutral. Information submitted demonstrates offeror's potential to meet performance or capability standards. Acceptable solution. Meets minimum standard requirements. Few or no advantages or strengths. A rating of "Satisfactory" indicates that, in terms of the specific factor (or subfactor), the offeror

may satisfactorily complete the proposed tasks, but there is at least moderate risk that he will not be successful. Equates to Neutral. Good probability of success as there is sufficient confidence that a fully compliant level of performance will be achieved. Meets all RFP requirements. Response exceeds a “Marginal” rating. **No significant advantages or disadvantages.**

**3.4. MARGINAL.** The proposal **meets most** of the minimum performance, capability or qualifications standards required by the RFP. Information submitted demonstrates offeror’s potential to marginally meet performance or capability standards necessary for minimal but acceptable contract performance. The submittal is not adequately responsive or does not address the specific factor(s) (or subfactor(s)). The offeror’s interpretation of the Government’s requirements is superficial, incomplete, vague, incompatible, incomprehensible, or incorrect. The assignment of a rating within the bounds of “Marginal” indicates that the evaluator feels that mandatory corrective action would be required to prevent significant deficiencies from affecting the overall project. The offeror’s response demonstrates an acceptable understanding of the requirements of the RFP and the approach will likely result in an adequate quality of performance, which represents a moderate level of risk to the Government. Low probability of success although the submittal has a reasonable chance of becoming at least acceptable. Response exceeds an “unsatisfactory” rating. **Significant disadvantages.**

**3.5. UNSATISFACTORY.** **Fails to meet** performance or capability standards. Requirements can only be met with major changes to the submittal. The submittal does not meet the minimum requirements of the RFP. There is no reasonable expectation that acceptable performance would be achieved. Offeror’s response has many deficiencies and/or gross omissions; failure to provide a reasonable, logical approach to fulfilling much of the Government’s requirements; failure to meet many of the minimum requirements. The offeror’s proposal is so unacceptable that it would have to be completely revised in order to attempt to make it other than unacceptable. **VERY SIGNIFICANT DISADVANTAGES.**

#### **4. TECHNICAL CRITERIA SUBMITTAL REQUIREMENTS.**

**4.1. Experience.** Provide documentation, which demonstrates the types of relevant experience of the team. Offerors should also explain how the information provided is relevant to the proposed acquisition. (Relevant is defined as a project that has been started and/or completed within the last five (5) years and has a logical connection with the criteria in the RFP). Examples of experience of the firm are multiple family housing projects; including townhouses, condominiums, apartments) or other projects similar in terms of complexity and magnitude to this project; i.e., office parks, commercial buildings, educational facilities, and laboratories. A maximum of five (5) projects will be evaluated. If more than five projects are submitted, only the first five projects will be evaluated starting with the most recent project and working back.

4.1.1. Using a format similar to that shown below, provide specific information on the projects listed.

***Relevant Experience of Firm:***

Project Title & Location
Project Construction Type (e.g., multiple family military housing)
Dollar Value (Construction)
Construction Start & Completion Dates (Month/Year)
Role of Firm(s) (e.g., prime, sub) (address type of work performed and percentage of work, as applicable); also include any proposed team members that were directly involved in this project, including work performed, roles and responsibilities.
Brief Description of Project (address how this relates to solicitation project)
Customer Point of Contact (i.e., name, relationship to project, agency/firm affiliation, city, state, current phone no, and email address if available)
Awards or recognition received (if applicable)

**4.2. Past Performance, including customer satisfaction, quality, and timely performance.** The Government will evaluate the relative merits of each offeror's past performance. The Government reserves the right to consider all aspects of an offeror's performance history, but will attribute more significance to work that was similar in nature, magnitude, and complexity to this project. A lack of past performance information will receive a neutral rating during evaluation. Government databases will be checked and previous customers may be contacted as references. Offerors shall submit a list of all customers (including current Point of Contact and phone number) to whom a Customer Satisfaction Survey was provided. (SEE THE REPRODUCIBLE FORM AT THE END OF THIS NOTICE). To be considered, the Surveys must be completed by the customers and mailed, hand-delivered, or faxed directly by the customer to the Contracting Office for receipt no later than the time and date the proposal is due.

Surveys submitted directly by offerors may not be considered. Please ensure envelopes containing surveys submitted to this office do not contain the offeror's return address.
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**4.2.1. AS A MINIMUM, THREE (3) CUSTOMER SATISFACTION SURVEYS SHALL BE RECEIVED FOR THE PRIME FIRM (i.e., the firm signing the Standard Form 1442, Solicitation, Offer and Award).**

**4.3 Qualifications.**

4.3.1. Provide the qualifications of the following key team individuals that will be assigned to this project; e.g. Project Superintendent, Quality Control/Quality

Assurance Manager (QC/QA). Resumes should be no more than two (2) pages per individual and submitted in a format similar to the one below:

***Personnel Qualifications/Experience***

Name/Title
Proposed Duties/Functions (for this project)
Firm Affiliation/Years Affiliated
Years of Experience (performing duties/functions as proposed for this project)
Education (Degree, Certification, Year, Specialization)
Active Registrations (Technical Licenses/Certifications)
Specific Qualifications (for this project, if any)
List of Projects Including:
Project Title & Location
Project Funding Type (Bid, Negotiated, Turnkey)
Dollar Value (construction \$)
Construction Start & Completion Dates (Month/Year)
Duties/Functions
Brief Description of Project

4.3.2. It is expected that the key team members actually utilized on this project will be exactly the same as proposed in the organizational chart. If any change is proposed before or after award, prior approval by the Contracting Officer is required. The offeror shall demonstrate how any new individuals or firms are as qualified for this project as those submitted with this proposal.

**4.4 SCHEDULE.**

4.4.1. The offeror is to provide an outline of the plan for construction of the project, including any associated demolition. The schedule should be prepared in the form of time-scaled (Gantt Chart) summary network diagram and should graphically indicate sequences proposed to accomplish each work operation and appropriate interdependencies between various activities.

4.4.2. Providing a schedule will be considered as meeting the RFP. In assigning more than a satisfactory rating, consideration will be given to the reasonableness of construction periods offered, including phasing of demolition, and identification of critical elements of construction that can delay the entire project.

**4.5 Organizational Structure.**

4.5.1. Provide a brief narrative describing the organizational structure, functional relationships, roles and responsibilities of the construction team proposed for this project. Provide an organizational chart showing the functional relationships of the proposed construction team, including support personnel. Provide a brief narrative on the team approach to the construction process. The more complete, reasonable and realistic the information provided, the higher the rating. All positions shall be identified, and to the extent possible, specific individuals should be identified.

#### **4.6 Extent of Small and Small Disadvantaged Business Participation.**

4.6.1 All offerors (both small and large businesses) are to provide information identifying the extent of participation by Small Businesses (SB), Historically Under-utilized Business (HUB) Zone concerns, Small Disadvantaged Businesses (SDB), Women-Owned Small Businesses (WOSB), Veteran-Owned Small Businesses (VOSB), and Service-disabled Veteran-owned Small Business concerns (SDVOSB), for work to be performed under this contract. The extent of participation will be evaluated. Even though work performed by both prime and subcontractors will be considered when evaluating participation, the recommended subcontracting goals, as provided in the "Notice to Large Business Firms" located in Section 000102 of the solicitation, will be used to evaluate the adequacy of the proposed participation.

4.6.2 Based on the total amount of work to be performed on this project, offerors (both small and large businesses) should submit the percentage of work by firm (NO DOLLAR AMOUNTS ARE TO BE SHOWN) including name, trade, and business size (e.g., Large (LB), Small (SB), Historically Under-utilized (HUBZ), Small Disadvantaged (SDB), Women-Owned (WOSB), Veteran-Owned (VOSB), and Service-disabled Veteran-owned Small Business concerns (SDVOSB) in the sample format shown below.

Note: Include all work performed by both prime and subs.

**DATA IS FOR EXAMPLE ONLY**			
Firm Name	Project Trade (or scope of responsibility)	Business Size (LB, SB, HUBZ, SDB, WOSB, VOSB, AND SDVOSB)	Work to be Performed by Firm <sup>3</sup>
Firm A	Mechanical	SB	61%
Firm B	Paving	SDB	9.5%
Firm C	Site Work	WOSB	5%
Firm D	Concrete Work	HUB	1.5%
Firm E	Structural	LB	20%
Firm F	Concrete Work	SDVOSB	1.5%

NOTE 1 - See FAR 52.219-8 Utilization of Small, Small Disadvantaged and Women-Owned Small Business Concerns in Section 00700 for a definition of these terms. For further guidance/information on laws or regulations referenced, use the following Internet address:

<http://www.sba.gov/library/lawroom.html>

NOTE 2 - A large business, will also be required to submit a formal subcontracting plan in the format provided in the "Notice" with their initial proposal.

NOTE 3 - Percentages in this column must total 100% to correctly identify all work being performed.

4.6.3. Small business participation will be evaluated as follows: Exceeds all equals outstanding; exceed some and met all others equals above average; met all equals satisfactory; not met equals marginal; and not met any equals unsatisfactory.

## **5. PROPOSAL CONTENTS.**

5.1. Proposals shall be submitted in two parts: a technical proposal and (b) a price proposal. Each shall be submitted in a separate envelope or package with the type of proposal (i.e., technical or price) clearly printed on the outside of the envelope or package. The maximum number of pages in the proposal shall be 30 with font size no smaller than 10 point. Proposals must set forth full, accurate, and complete information as required by this RFP. Absence of information will be deemed as if no support for that criteria is available. Offerors submitting proposals should limit submission to data essential for evaluation of proposals so that a minimum of time and moneys are expended in preparing information required by the RFP. Proposals are to be on 8 ½x 11 – inch paper, to the maximum extent practicable, and submitted in standard letter (8 ½x 11-inch) hardback loose-leaf binders. Contents of binders shall be tabbed and labeled to afford easy identification from the proposal Table of Contents. No material shall be incorporated by reference or reiteration of the RFP. Any such material will not be considered for evaluation. It shall be presented in a manner, which allows it to "STAND ALONE" without need for evaluators to reference other documents. Photographs and organizational charts will not be considered a page. Proposals in excess of 30 pages may be discarded. Unnecessarily elaborate brochures or other presentation materials beyond those sufficient to present a complete and effective response are not desired and may be construed as an indication of the proposer's lack of cost-consciousness. Penalty for making false statements in proposals is prescribed in 18 U.S.C. 1001.

5.2. **Technical Proposal Format.** As a minimum, each copy of the technical proposal should contain the information, and follow the general format specified below. Pages should be numbered from beginning to end, without repeating for new sections.

**TECHNICAL PROPOSAL (5 SETS REQUIRED (ORIGINAL + 4 COPIES))**

- Technical Proposal Cover Letter, to include:
  - Solicitation Number
  - Name, address, and telephone and facsimile numbers of the Offeror (and electronic address, if available)
  - Names, titles, and telephone and facsimile numbers (and electronic addresses if available) of persons authorized to negotiate on the Offeror's behalf with the Government in connection with this solicitation
  - Names, title, and signature of the person authorized to sign the proposal.
  - A statement specifying the extent of agreement to furnish any and all items upon which prices are offered at the prices set opposite each item.
  - A statement that the offer has an acceptance period of 120 calendar days from the date the offer is submitted.
- Table of Contents. List all sections for the technical proposal. Any future amendments, additions and/or revisions to proposal shall include updated Table of Contents for each set.
- Relevant Experience
- Qualifications
- Organizational Structure
- Past Performance
- Extent of Small and Small Disadvantaged Business Participation

5.1.3. **Price proposal** shall be submitted in ORIGINAL only, and must be signed by an official authorized to bind your firm. Note that SF 1442, Block 13D, provides the number of calendar days after the date of the offer which the proposal is firm. Provide the name, address, phone, and fax numbers for your bank and bonding company. The price proposal, to be submitted at the same time as technical proposal, should include:

**Price Proposal (Original Only)**

- SF 1442, Solicitation, Offer and Award and Award and Corporate
- Acknowledge all amendments by number and date in Block 19 on SF 1442 BACK
- Pricing Schedule
- Section 00600, Representation, Certifications and Other Statements of Offerors and Pre-award Information
- Bid Bond
- Small and Small Disadvantaged Business Subcontracting Plan (if applicable). (NOTE: SUBCONTRACTING PLAN APPLIES TO LARGE BUSINESS ONLY).

**6. SELECTION AND AWARD WITHOUT DISCUSSIONS.** It is the intent of the Government to make award based upon initial offers, without further discussions or additional information. Therefore, proposals should be submitted initially on the most favorable terms from a price and technical standpoint. Do not assume you will be

afforded the opportunity to clarify, discuss or revise your proposal. If award is not made on initial offers, discussions will be conducted as described below.

**7. COMPETITIVE RANGE.** After initial evaluation of proposals, if the Contracting Officer determines that discussions are to be conducted, the Contracting Officer will establish a competitive range comprised of all of the highest rated technical proposals, unless the range is further reduced for purposes of efficiency (i.e., the Contracting Officer may determine that the number of most highly rated proposals that might otherwise be included in the competitive range exceeds the number at which an efficient competition can be conducted). Discussions may be held with firms in the competitive range.

**8. DISCUSSIONS.** Written or oral (i.e., telephonic) discussions may be conducted by the Government with all offerors in the competitive range. As a result of discussions, offerors may make revisions to their initial offers. If an offeror's proposal is eliminated or otherwise removed from the competitive range during discussions, no further revisions to that offeror's proposal will be accepted or considered. Discussions will culminate in a request for Final Proposal Revision, the date and time of which will be common to all offerors.

**9. SELECTION AND AWARD.** The Government intends to make award based on initial offers. If discussions are conducted, then after receipt of Final Proposal Revision, the Technical Evaluation Team will evaluate supplemental information provided by offerors, adjust technical ratings previously assigned, and provide a recommendation to the Contracting Officer. Subsequently, and after evaluation of any changes to proposed prices, the Contracting Officer will perform a best-value analysis. Selection will be made on the basis of the responsible offer, which conforms to the RFP and represents the most advantageous offer to the Government, subject to availability of funds.

## **10. BEST-VALUE ANALYSIS**

10.1. The Government is more concerned with obtaining superior experience & qualifications, than with making award at the lowest overall cost to the Government. In determining the best value to the Government, the tradeoff process of evaluation will be utilized. The tradeoff process permits tradeoffs among cost or price and non-cost factors, and allows the Government to consider award to other than the lowest priced offeror or other than the highest technically rated offeror.

10.2. **You are advised that greater consideration will be given to the evaluation of technical proposals rather than price, with price being significantly less important.** The best-value offer will be selected using a tradeoff analysis of technical ratings and price. In making this determination, the Government is concerned with achieving a highly qualified firm with a reasonable price. It is pointed out, however, that should technical competence between offerors be considered approximately the same, the price could become more important in determining award.

**11. DEBRIEFINGS.** Upon written request to the Contracting Officer, unsuccessful offerors will be debriefed and furnished the basis for the selection decision and contract award. Debriefings will be in accordance with FAR Part 15. 505 and 15.506.

**12 PROPOSAL EXPENSES AND PRECONTRACT COSTS.** This RFP does not commit the Government to pay costs incurred in preparation and submission of the initial and any subsequent proposals or for any other costs incurred prior to execution of a formal contract.

## SECTION 00100 Bidding Schedule/Instructions to Bidders

## CLAUSES INCORPORATED BY FULL TEXT

**TABLE OF CONTENTS****SECTION 00100  
Bidding Schedule/Instructions to Bidders**

52.211-2	Availability of Specifications Listed in the DoD Index of Specifications and Standards (DODISS) and Descriptions Listed in the Acquisition Management Systems and Data Requirements Control List, DOD 5010.12-L	DEC 1999
52.214-34	Submission Of Offers In The English Language	APR 1991
52.214-4021	Award	DEC 1999
52.214-4022	Basis of Award	DEC 1999
52.214-5000	Apparent Clerical Mistakes	MAY 1999
52.215-1	Instructions to Offerors--Competitive Acquisition	MAY 2001
52.216-1	Type Of Contract	APR 1984
52.217-5	Evaluation Of Options	JUL 1990
52.225-10	Notice of Buy American Act/Balance of Payments Program Requirement--Construction Materials	FEB 2000
52.228-1	Bid Guarantee	SEP 1996
52.228-4001	Information Regarding Performance and Payment Bonds (FAR 28.102)	FEB 2001
52.228-4003	Individual Sureties	DEC 1999
52.232-38	Submission of Electronic Funds Transfer Information with Offer	MAY 1999
52.233-2	Service Of Protest	AUG 1996
52.236-28	Preparation of Proposals--Construction	OCT 1997
52.236-4902	Magnitude of Construction	DEC 1999
252.204-7001	Commercial And Government Entity (CAGE) Code Reporting	AUG 1999
252.204-7004	Required Central Contractor Registration	NOV 2001

52.211-2 AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) AND DESCRIPTIONS LISTED IN THE ACQUISITION MANAGEMENT SYSTEMS AND DATA REQUIREMENTS CONTROL LIST, DOD 5010.12-L (DEC 1999)

Copies of specifications, standards, and data item descriptions cited in this solicitation may be obtained--

(a) From the ASSIST database via the Internet at <http://assist.daps.mil>; or

(b) By submitting a request to the--Department of Defense Single Stock Point (DoDSSP), Building 4, Section D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Telephone (215) 697-2667/2179, Facsimile (215) 697-1462.

(End of provision)

52.214-34 SUBMISSION OF OFFERS IN THE ENGLISH LANGUAGE (APR 1991)

Offers submitted in response to this solicitation shall be in the English language. Offers received in other than English shall be rejected.

(End of provision)

Award (52.214-4021)

Notwithstanding any other provisions of this solicitation, the Government intends to make award to only one bidder. Failure to include a price for all items in the schedule will result in the bid/offer being rejected as nonresponsive.

Basis of Award (52.214-4022)

Notwithstanding any other provision of this invitation, the Government will award all base bid items as a minimum.

#### 52.214-5000 APPARENT CLERICAL MISTAKES (MAR 1995)--EFARS

(a) For the purpose of initial evaluations of bids, the following will be utilized in the resolving arithmetic discrepancies found on the face of bidding schedule as submitted by the bidder:

- (1) Obviously misplaced decimal points will be corrected;
- (2) Discrepancy between unit price and extended price, the unit price will govern;
- (3) Apparent errors in extension of unit prices will be corrected;
- (4) Apparent errors in addition of lump-sum and extended prices will be corrected.

(b) For the purpose of bid evaluation, the government will proceed on the assumption that the bidder intends his bid to be evaluated on basis of the unit prices, the totals arrived at by resolution of arithmetic discrepancies as provided above and the bid will be so reflected on the abstract of bids.

(c) These correction procedures shall not be used to resolve any ambiguity concerning which bid is low.

(End of statement)

#### 52.215-1 INSTRUCTIONS TO OFFERORS--COMPETITIVE ACQUISITION (MAY 2001)

(a) Definitions. As used in this provision--

“Discussions” are negotiations that occur after establishment of the competitive range that may, at the Contracting Officer's discretion, result in the offeror being allowed to revise its proposal.

In writing, writing, or written means any worded or numbered expression that can be read, reproduced, and later communicated, and includes electronically transmitted and stored information.

“Proposal modification” is a change made to a proposal before the solicitation's closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.

“Proposal revision” is a change to a proposal made after the solicitation closing date, at the request of or as allowed by a Contracting Officer as the result of negotiations.

“Time”, if stated as a number of days, is calculated using calendar days, unless otherwise specified, and will include Saturdays, Sundays, and legal holidays. However, if the last day falls on a Saturday, Sunday, or legal holiday, then the period shall include the next working day.

(b) Amendments to solicitations. If this solicitation is amended, all terms and conditions that are not amended remain unchanged. Offerors shall acknowledge receipt of any amendment to this solicitation by the date and time specified in the amendment(s).

(c) Submission, modification, revision, and withdrawal of proposals. (1) Unless other methods (e.g., electronic commerce or facsimile) are permitted in the solicitation, proposals and modifications to proposals shall be submitted in paper media in sealed envelopes or packages (i) addressed to the office specified in the solicitation, and (ii) showing the time and date specified for receipt, the solicitation number, and the name and address of the offeror.

Offerors using commercial carriers should ensure that the proposal is marked on the outermost wrapper with the information in paragraphs (c)(1)(i) and (c)(1)(ii) of this provision.

(2) The first page of the proposal must show--

(i) The solicitation number;

(ii) The name, address, and telephone and facsimile numbers of the offeror (and electronic address if available);

(iii) A statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation and agreement to furnish any or all items upon which prices are offered at the price set opposite each item;

(iv) Names, titles, and telephone and facsimile numbers (and electronic addresses if available) of persons authorized to negotiate on the offeror's behalf with the Government in connection with this solicitation; and

(v) Name, title, and signature of person authorized to sign the proposal. Proposals signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(3) Submission, modification, or revision, of proposals.

(i) Offerors are responsible for submitting proposals, and any modifications, or revisions, so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that proposal or revision is due.

(ii)(A) Any proposal, modification, or revision received at the Government office designated in the solicitation after the exact time specified for receipt of offers is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and--

(1) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(2) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(3) It is the only proposal received.

(B) However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(iii) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(iv) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(v) Proposals may be withdrawn by written notice received at any time before award. Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be

withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision at 52.215-5, Facsimile Proposals. Proposals may be withdrawn in person by an offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

(4) Unless otherwise specified in the solicitation, the offeror may propose to provide any item or combination of items.

(5) Offerors shall submit proposals in response to this solicitation in English, unless otherwise permitted by the solicitation, and in U.S. dollars, unless the provision at FAR 52.225-17, Evaluation of Foreign Currency Offers, is included in the solicitation.

(6) Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake at any time before award.

(7) Offerors may submit revised proposals only if requested or allowed by the Contracting Officer.

(8) Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Contracting Officer.

(d) Offer expiration date. Proposals in response to this solicitation will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the offeror).

(e) Restriction on disclosure and use of data. Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall--

(1) Mark the title page with the following legend: This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed--in whole or in part--for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of--or in connection with-- the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]; and

(2) Mark each sheet of data it wishes to restrict with the following legend: Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

(f) Contract award. (1) The Government intends to award a contract or contracts resulting from this solicitation to the responsible offeror(s) whose proposal(s) represents the best value after evaluation in accordance with the factors and subfactors in the solicitation.

(2) The Government may reject any or all proposals if such action is in the Government's interest.

(3) The Government may waive informalities and minor irregularities in proposals received.

(4) The Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). Therefore, the offeror's initial proposal should contain the offeror's best terms from a cost or price and technical standpoint. The Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary. If the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(5) The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the

proposal.

(6) The Government reserves the right to make multiple awards if, after considering the additional administrative costs, it is in the Government's best interest to do so.

(7) Exchanges with offerors after receipt of a proposal do not constitute a rejection or counteroffer by the Government.

(8) The Government may determine that a proposal is unacceptable if the prices proposed are materially unbalanced between line items or subline items. Unbalanced pricing exists when, despite an acceptable total evaluated price, the price of one or more contract line items is significantly overstated or understated as indicated by the application of cost or price analysis techniques. A proposal may be rejected if the Contracting Officer determines that the lack of balance poses an unacceptable risk to the Government.

(9) If a cost realism analysis is performed, cost realism may be considered by the source selection authority in evaluating performance or schedule risk.

(10) A written award or acceptance of proposal mailed or otherwise furnished to the successful offeror within the time specified in the proposal shall result in a binding contract without further action by either party.

(11) The Government may disclose the following information in postaward debriefings to other offerors:

- (i) The overall evaluated cost or price and technical rating of the successful offeror;
- (ii) The overall ranking of all offerors, when any ranking was developed by the agency during source selection;
- (iii) A summary of the rationale for award; and
- (iv) For acquisitions of commercial items, the make and model of the item to be delivered by the successful offeror.

(End of provision)

#### 52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a FIRM FIXED PRICE (FFP) contract resulting from this solicitation.

(End of clause)

#### 52.217-5 EVALUATION OF OPTIONS (JUL 1990)

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

(End of Provision)

#### 52.225-10 NOTICE OF BUY AMERICAN ACT/BALANCE OF PAYMENTS PROGRAM REQUIREMENT--CONSTRUCTION MATERIALS (FEB 2000)

(a) Definitions. Construction material, domestic construction material, and foreign construction material, as used in this provision, are defined in the clause of this solicitation entitled "Buy American Act--Balance of Payments Program--Construction Materials" (Federal Acquisition Regulation (FAR) clause 52.225-9).

(b) Requests for determinations of inapplicability. An offeror requesting a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program should submit the request to the

Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of the clause at FAR 52.225-9 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) Evaluation of offers. (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act or Balance of Payments Program, based on claimed unreasonable cost of domestic construction material, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(3)(i) of the clause at FAR 52.225-9.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) Alternate offers.

(1) When an offer includes foreign construction material not listed by the Government in this solicitation in paragraph (b)(2) of the clause at FAR 52.225-9, the offeror also may submit an alternate offer based on use of equivalent domestic construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of the clause at FAR 52.225-9 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of the clause at FAR 52.225-9 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic construction material, and the offeror shall be required to furnish such domestic construction material. An offer based on use of the foreign construction material for which an exception was requested--

(i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.

(End of provision)

#### 52.228-1 BID GUARANTEE (SEP 1996)

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of the bid.

(b) The bidder shall furnish a bid guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids, and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.

(c) The amount of the bid guarantee shall be 20% percent of the bid price or \$3,000,000, whichever is less.

(d) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 10 days after receipt of the forms by the bidder, the Contracting Officer may terminate the contract for default.

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference.

#### INFORMATION REGARDING PERFORMANCE AND PAYMENT BONDS (FAR 28.102) (52.228-4001) FEB 2001

Within 10 days after the prescribed forms are presented to the bidder to whom award is made, unless a shorter time is prescribed in the contract, two bonds, namely a performance bond (Standard Form 25) and a payment bond (Standard Form 25A), shall be executed and furnished to the Government, each with good and sufficient surety or sureties acceptable to the Government. The penal sums of such bonds shall be as follows:

(1) Performance Bond. The penal sum of the performance bond shall equal one hundred percent (100%) of the contract price.

(2) Payment Bond. The penal sum of the payment bond shall equal one hundred percent (100%) of the contract price.

Any bonds furnished must be furnished by the Contractor to the Government prior to commencement of contract performance.

#### INDIVIDUAL SURETIES (52.228-4003) DEC 1999

As prescribed in FAR 28.203, individual sureties are acceptable for all types of bonds except position schedule bonds.

One individual surety is adequate support for a bond, provided the unencumbered value of the assets pledged by that individual surety equal or exceed the amount of the bond. An offeror may submit up to three individual sureties for each bond, in which case the pledged assets, when combined, must equal or exceed the penal amount of the bond. Each individual surety must accept both joint and several liability to the extent of the penal amount of the bond.

An individual surety may be accepted only if a security interest in acceptable assets is provided to the Government by the individual surety. **THE SECURITY INTEREST SHALL BE FURNISHED WITH THE BOND.**

Acceptable assets include:

- (a) Cash, or certificates of deposit, or other cash equivalents with a federally insured financial institution;
- (b) United States Government securities at market value.
- (c) Stocks and bonds actively traded on a national U.S. security exchange with certificates issued in the name of the individual surety. (See FAR 28.203-2(b)(3) for list of acceptable exchanges).

(d) Real property owned in fee simple by the surety without any form of concurrent ownership, except as provided in FAR 28.203-2(c) (3)(iii), and located within the 50 United States, its territories, or possessions. These assets will be accepted at 100% of the most current tax assessment value (exclusive of encumbrances) or 75% of the properties' unencumbered market value provided a current appraisal is furnished. (See clause entitled "Pledges of Assets").

(e) Irrevocable letters of credit (ILC) issued by a federally insured financial institution in the name of the contracting agency and which identify the agency and solicitation or contract number for which the ILC is provided.

Unacceptable assets include but are not limited to:

- (a) Notes or accounts receivable;
- (b) Foreign securities;
- (c) Real property as follows:
  - (1) Real property located outside the United States, its territories, or possessions.
  - (2) Real property which is a principal residence of the surety.
  - (3) Real property owned concurrently regardless of the form of co-tenancy (including joint tenancy, tenancy by the entirety, and tenancy in common) except where all co-tenants agree to act jointly.
  - (4) Life estates, leasehold estates, or future interests in real property.
- (d) Personal property other than that listed as acceptable assets above (e.g., jewelry, furs, antiques);

(e) Stocks and bonds of the individual surety in a controlled, affiliated, or closely held concern of the offeror/contractor;

(f) corporate assets (e.g., plant and equipment);

(g) Speculative assets (e.g., mineral rights);

(h) Letters of credit, except as provided above.

In order for the Contracting Officer to determine the acceptability of individuals proposed as sureties, all bidders/offerors who submit bonds which are executed by individual sureties shall furnish with the bonds:

(a) SF28, Affidavit of Individual Surety,

(b) Security interest provided to the Government for all pledged assets (See clause entitled "Pledge of Assets") and

(c) A current list of all other bonds (including Bid Bonds) on which each individual surety is a surety and bonds for which the individual is requesting to be a surety, together with a statement as to the percent of completion of these bonded jobs. The list will include Contract or Solicitation Numbers, the name, address and telephone number of the contracting office, the type of bond (bid, performance or payment), and the amount of each original obligation. (Note: Performance and Payment bonds must be listed separately.)

Failure to furnish this information may result in non-approval of the surety and a determination of nonresponsibility.

#### 52.232-38 SUBMISSION OF ELECTRONIC FUNDS TRANSFER INFORMATION WITH OFFER (MAY 1999)

The offeror shall provide, with its offer, the following information that is required to make payment by electronic funds transfer (EFT) under any contract that results from this solicitation. This submission satisfies the requirement to provide EFT information under paragraphs (b)(1) and (j) of the clause at 52.232-34, Payment by Electronic Funds Transfer--Other than Central Contractor Registration.

(1) The solicitation number (or other procurement identification number).

(2) The offeror's name and remittance address, as stated in the offer.

(3) The signature (manual or electronic, as appropriate), title, and telephone number of the offeror's official authorized to provide this information.

(4) The name, address, and 9-digit Routing Transit Number of the offeror's financial agent.

(5) The offeror's account number and the type of account (checking, savings, or lockbox).

(6) If applicable, the Fedwire Transfer System telegraphic abbreviation of the offeror's financial agent.

(7) If applicable, the offeror shall also provide the name, address, telegraphic abbreviation, and 9-digit Routing Transit Number of the correspondent financial institution receiving the wire transfer payment if the offeror's financial agent is not directly on-line to the Fedwire and, therefore, not the receiver of the wire transfer payment.

(End of provision)

#### 52.233-2 SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from Kent R. Paul, Chief, Contracting Division, Post Office Box 3755, Seattle, WA 98124-3755.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of provision)

52.236-28 PREPARATION OF PROPOSALS--CONSTRUCTION (OCT 1997)

(a) Proposals must be (1) submitted on the forms furnished by the Government or on copies of those forms, and (2) manually signed. The person signing a proposal must initial each erasure or change appearing on any proposal form.

(b) The proposal form may require offerors to submit proposed prices for one or more items on various bases, including--

(1) Lump sum price;

(2) Alternate prices;

(3) Units of construction; or

(4) Any combination of paragraphs (b)(1) through (b)(3) of this provision.

(c) If the solicitation requires submission of a proposal on all items, failure to do so may result in the proposal being rejected without further consideration. If a proposal on all items is not required, offerors should insert the words "no proposal" in the space provided for any item on which no price is submitted.

(d) Alternate proposals will not be considered unless this solicitation authorizes their submission.

(End of provision)

MAGNITUDE OF CONSTRUCTION (FAR 36.204) (52. 236-4902) DEC 1999

(a) Amount of Construction for this solicitation is in the range of \$5,000,000 to \$10,000,000.

252.204-7001 COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (AUG 1999)

(a) The offeror is requested to enter its CAGE code on its offer in the block with its name and address. The CAGE code entered must be for that name and address. Enter "CAGE" before the number.

(b) If the offeror does not have a CAGE code, it may ask the Contracting Officer to request one from the Defense Logistics Information Service (DLIS). The Contracting Officer will--

(1) Ask the Contractor to complete section B of a DD Form 2051, Request for Assignment of a Commercial and Government Entity (CAGE) Code;

(2) Complete section A and forward the form to DLIS; and

(3) Notify the Contractor of its assigned CAGE code.

(c) Do not delay submission of the offer pending receipt of a CAGE code.

(End of provision)

252.204-7004 REQUIRED CENTRAL CONTRACTOR REGISTRATION.(NOV 2001)

(a) Definitions.

As used in this clause--

(1) Central Contractor Registration (CCR) database means the primary DoD repository for contractor information required for the conduct of business with DoD.

(2) Data Universal Numbering System (DUNS) number means the 9-digit number assigned by Dun and Bradstreet Information Services to identify unique business entities.

(3) Data Universal Numbering System +4 (DUNS+4) number means the DUNS number assigned by Dun and Bradstreet plus a 4-digit suffix that may be assigned by a parent (controlling) business concern. This 4-digit suffix may be assigned at the discretion of the parent business concern for such purposes as identifying subunits or affiliates of the parent business concern.

(4) Registered in the CCR database means that all mandatory information, including the DUNS number or the DUNS+4 number, if applicable, and the corresponding Commercial and Government Entity (CAGE) code, is in the CCR database; the DUNS number and the CAGE code have been validated; and all edits have been successfully completed.

(b)(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee must be registered in the CCR database prior to award, during performance, and through final payment of any contract resulting from this solicitation, except for awards to foreign vendors for work to be performed outside the United States.

(2) The offeror shall provide its DUNS or, if applicable, its DUNS+4 number with its offer, which will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(3) Lack of registration in the CCR database will make an offeror ineligible for award.

(4) DoD has established a goal of registering an applicant in the CCR database within 48 hours after receipt of a complete and accurate application via the Internet. However, registration of an applicant submitting an application through a method other than the Internet may take up to 30 days. Therefore, offerors that are not registered should consider applying for registration immediately upon receipt of this solicitation.

(c) The Contractor is responsible for the accuracy and completeness of the data within the CCR, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to confirm on an annual basis that its information in the CCR database is accurate and complete.

(d) Offerors and contractors may obtain information on registration and annual confirmation requirements by calling 1-888-227-2423, or via the Internet at <http://www.ccr.com>.

(End of clause)

## SECTION 00600 Representations &amp; Certifications

## CLAUSES INCORPORATED BY FULL TEXT

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## 52.203-2 CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985)

(a) The offeror certifies that --

(1) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to --

(i) Those prices,

(ii) The intention to submit an offer, or

(iii) The methods of factors used to calculate the prices offered:

(2) The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) No attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory --

(1) Is the person in the offeror's organization responsible for determining the prices offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision; or

(2) (i) Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision \_\_\_\_\_ (insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization);

(ii) As an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision.

(c) If the offeror deletes or modifies subparagraph (a)(2) of this provision, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

(End of provision)

#### 52.203-11 CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991)

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this Certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that on or after December 23, 1989,--

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting Officer; and

(3) He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, Title 31, United States Code. Any person who makes an expenditure prohibited under this provision, shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000, for each such failure.

(End of provision)

#### 52.204-3 TAXPAYER IDENTIFICATION (OCT 1998)

##### (a) Definitions.

“Common parent,” as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

“Taxpayer Identification Number (TIN),” as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

##### (d) Taxpayer Identification Number (TIN).

\_\_\_ TIN:\_\_\_\_\_

\_\_\_ TIN has been applied for.

\_\_\_ TIN is not required because:

\_\_\_ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

\_\_\_ Offeror is an agency or instrumentality of a foreign government;

\_\_\_ Offeror is an agency or instrumentality of the Federal Government.

##### (e) Type of organization.

\_\_\_ Sole proprietorship;

\_\_\_ Partnership;

\_\_\_ Corporate entity (not tax-exempt);

\_\_\_ Corporate entity (tax-exempt);

- \_\_\_ Government entity (Federal, State, or local);
- \_\_\_ Foreign government;
- \_\_\_ International organization per 26 CFR 1.6049-4;
- \_\_\_ Other \_\_\_\_\_

(f) Common parent.

\_\_\_ Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

\_\_\_ Name and TIN of common parent:

Name \_\_\_\_\_

TIN \_\_\_\_\_

(End of provision)

#### 52.204-5 WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) (MAY 1999)

(a) Definition. Women-owned business concern, as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) Representation. [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219-1, Small Business Program Representations, of this solicitation.] The offeror represents that it ( ) is a women-owned business concern.

(End of provision)

#### 52.209-5 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (DEC 2001)

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that--

(i) The Offeror and/or any of its Principals--

(A) Are ( ) are not ( ) presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have ( ) have not ( ), within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property;

(C) Are ( ) are not ( ) presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in subdivision (a)(1)(i)(B) of this provision.

(ii) The Offeror has ( ) has not ( ), within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER SECTION 1001, TITLE 18, UNITED STATES CODE.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

(End of provision)

#### 52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS (MAY 2001) ALTERNATE I (OCT 2000) & ALTERNATE II (OCT 2000)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 233220.

(2) The small business size standard is \$27.5 million.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) Representations. (1) The offeror represents as part of its offer that it ( ) is, ( ) is not a small business concern.

(2) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, for general statistical purposes, that it ( ) is, ( ) is not a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it ( ) is, ( ) is not a women-owned small business concern.

(4) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it ( ) is, ( ) is not a veteran-owned small business concern.

(5) (Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.) The offeror represents as part of its offer that it ☐ is, ☐ is not a service-disabled veteran-owned small business concern.

(6) (Complete only if offeror represented itself as small business concern in paragraph (b)(1) of this provision). The offeror represents, as part of its offer, that--

(i) It ☐ is, ☐ is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR Part 126; and

(ii) It ☐ is, ☐ is not a joint venture that complies with the requirements of 13 CFR Part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. (The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture: \_\_\_\_\_.) Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(7) (Complete if offeror represented itself as disadvantaged in paragraph (b)(2) of this provision.) The offeror shall check the category in which its ownership falls:

☐ Black American.

☐ Hispanic American.

☐ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).

☐ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).

☐ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).

(c) Definitions. As used in this provision--

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

Small business concern means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

Veteran-owned small business concern means a small business concern--

- (1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and
- (2) The management and daily business operations of which are controlled by one or more veterans.

Women-owned small business concern means a small business concern --

- (1) That is at least 51 percent owned by one or more women; in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and
- (2) Whose management and daily business operations are controlled by one or more women.

(d) Notice.

(1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small, HUBZone small, small disadvantaged, or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to section 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall--

- (i) Be punished by imposition of fine, imprisonment, or both;
- (ii) Be subject to administrative remedies, including suspension and debarment; and
- (iii) Be ineligible for participation in programs conducted under the authority of the Act.

(End of provision)

#### 52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (JAN 1999)

(a) Definition. HUBZone small business concern, as used in this clause, means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

(b) Evaluation preference. (1) Offers will be evaluated by adding a factor of 10 percent to the price of all offers, except--

- (i) Offers from HUBZone small business concerns that have not waived the evaluation preference;
- (ii) Otherwise successful offers from small business concerns;
- (iii) Otherwise successful offers of eligible products under the Trade Agreements Act when the dollar threshold for application of the Act is exceeded (see 25.402 of the Federal Acquisition Regulation (FAR)); and
- (iv) Otherwise successful offers where application of the factor would be inconsistent with a Memorandum of Understanding or other international agreement with a foreign government.

(2) The factor of 10 percent shall be applied on a line item basis or to any group of items on which award may be made. Other evaluation factors described in the solicitation shall be applied before application of the factor.

(3) A concern that is both a HUBZone small business concern and a small disadvantaged business concern will receive the benefit of both the HUBZone small business price evaluation preference and the small disadvantaged business price evaluation adjustment (see FAR clause 52.219-23). Each applicable price evaluation preference or adjustment shall be calculated independently against an offeror's base offer.

These individual preference amounts shall be added together to arrive at the total evaluated price for that offer.

(c) Waiver of evaluation preference. A HUBZone small business concern may elect to waive the evaluation preference, in which case the factor will be added to its offer for evaluation purposes. The agreements in paragraph (d) of this clause do not apply if the offeror has waived the evaluation preference.

\_\_\_ Offeror elects to waive the evaluation preference.

(d) Agreement. A HUBZone small business concern agrees that in the performance of the contract, in the case of a contract for

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other HUBZone small business concerns;

(2) Supplies (other than procurement from a nonmanufacturer of such supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other HUBZone small business concerns;

(3) General construction, at least 15 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns; or

(4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns.

(e) A HUBZone joint venture agrees that in the performance of the contract, the applicable percentage specified in paragraph (d) of this clause will be performed by the HUBZone small business participant or participants.

(f) A HUBZone small business concern nonmanufacturer agrees to furnish in performing this contract only end items manufactured or produced by HUBZone small business manufacturer concerns. This paragraph does not apply in connection with construction or service contracts.

(End of clause)

#### 52.219-19 SMALL BUSINESS CONCERN REPRESENTATION FOR THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (OCT 2000)

(a) Definition.

"Emerging small business" as used in this solicitation, means a small business concern whose size is no greater than 50 percent of the numerical size standard applicable to the North American Industry Classification System (NAICS) code assigned to a contracting opportunity.

(b) [Complete only if the Offeror has represented itself under the provision at 52.219-1 as a small business concern under the size standards of this solicitation.] The Offeror [ ] is, [ ] is not an emerging small business.

(c) (Complete only if the Offeror is a small business or an emerging small business, indicating its size range.)

Offeror's number of employees for the past 12 months (check this column if size standard stated in solicitation is expressed in terms of number of employees) or Offeror's average annual gross revenue for the last 3 fiscal years (check this column if size standard stated in solicitation is expressed in terms of annual receipts). (Check one of the following.)

No. of Employees    Avg. Annual Gross Revenues

☐ 50 or fewer    ☐ \$1 million or less  
☐ 51 - 100    ☐ \$1,000,001 - \$2 million  
☐ 101 - 250    ☐ \$2,000,001 - \$3.5 million  
☐ 251 - 500    ☐ \$3,500,001 - \$5 million  
☐ 501 - 750    ☐ \$5,000,001 - \$10 million  
☐ 751 - 1,000    ☐ \$10,000,001 - \$17 million  
☐ Over 1,000    ☐ Over \$17 million

(End of provision)

#### 52.222-22    PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999)

The offeror represents that --

(a) ☐ It has, ☐ has not participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation;

(b) ☐ It has, ☐ has not, filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(End of provision)

#### 52.222-25    AFFIRMATIVE ACTION COMPLIANCE (APR 1984)

The offeror represents that

(a) ☐ it has developed and has on file, ☐ has not developed and does not have on file, at each establishment, affirmative action programs required by the rules and regulations of the Secretary of Labor (41 CFR 60-1 and 60-2), or

(b) ☐ has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

(End of provision)

#### 52.223-4    RECOVERED MATERIAL CERTIFICATION (OCT 1997)

As required by the Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6962(c)(3)(A)(i)), the offeror certifies, by signing this offer, that the percentage of recovered materials to be used in the performance of the contract will be at least the amount required by the applicable contract specifications.

## 52.223-13 CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (OCT 2000)

(a) Submission of this certification is a prerequisite for making or entering into this contract imposed by Executive Order 12969, August 8, 1995.

(b) By signing this offer, the offeror certifies that--

(1) As the owner or operator of facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106), the offeror will file and continue to file for such facilities for the life of the contract the Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject to the Form R filing and reporting requirements because each such facility is exempt for at least one of the following reasons: (Check each block that is applicable.)

☐ (i) The facility does not manufacture, process or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

☐ (ii) The facility does not have 10 or more full-time employees as specified in section 313.(b)(1)(A) of EPCRA 42 U.S.C. 11023(b)(1)(A);

☐ (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

☐ (iv) The facility does not fall within Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

☐ (v) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

## 252.209-7001 DISCLOSURE OF OWNERSHIP OR CONTROL BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)

(a) "Definitions."

As used in this provision --

(a) "Government of a terrorist country" includes the state and the government of a terrorist country, as well as any political subdivision, agency, or instrumentality thereof.

(2) "Terrorist country" means a country determined by the Secretary of State, under section 6(j)(1)(A) of the Export Administration Act of 1979 (50 U.S.C. App. 2405(j)(i)(A)), to be a country the government of which has repeatedly provided support for such acts of international terrorism. As of the date of this provision, terrorist countries include: Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria.

(3) "Significant interest" means --

(i) Ownership of or beneficial interest in 5 percent or more of the firm's or subsidiary's securities. Beneficial interest

includes holding 5 percent or more of any class of the firm's securities in "nominee shares," "street names," or some other method of holding securities that does not disclose the beneficial owner;

- (ii) Holding a management position in the firm, such as a director or officer;
  - (iii) Ability to control or influence the election, appointment, or tenure of directors or officers in the firm;
  - (iv) Ownership of 10 percent or more of the assets of a firm such as equipment, buildings, real estate, or other tangible assets of the firm; or
  - (v) Holding 50 percent or more of the indebtedness of a firm.
- (b) "Prohibition on award."

In accordance with 10 U.S.C. 2327, no contract may be awarded to a firm or a subsidiary of a firm if the government of a terrorist country has a significant interest in the firm or subsidiary or, in the case of a subsidiary, the firm that owns the subsidiary, unless a waiver is granted by the Secretary of Defense.

(c) "Disclosure."

If the government of a terrorist country has a significant interest in the Offeror or a subsidiary of the Offeror, the Offeror shall disclose such interest in an attachment to its offer. If the Offeror is a subsidiary, it shall also disclose any significant interest the government of a terrorist country has in any firm that owns or controls the subsidiary. The disclosure shall include --

- (1) Identification of each government holding a significant interest; and
- (2) A description of the significant interest held by each government.

(End of provision)

#### 252.209-7002 DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT (SEP 1994)

(a) Definitions. As used in this provision--

(1) "Entity controlled by a foreign government" means--

(i) Any domestic or foreign organization or corporation that is effectively owned or controlled by a foreign government; or

(ii) Any individual acting on behalf of a foreign government.

(2) "Effectively owned or controlled" means that a foreign government or any entity controlled by a foreign government has the power, either directly or indirectly, whether exercised or exercisable, to control or influence the election or appointment of the Offeror's officers, directors, partners, regents, trustees, or a majority of the Offeror's board of directors by means, e.g., ownership, contract, or operation of law.

(3) "Foreign government" means any governing body organized and existing under the laws of any country other than the United States and its possessions and trust territories and any agent or instrumentality of that government.

(4) "Proscribed information" means--

(i) Top Secret information;

(ii) Communications Security (COMSEC) information, except classified keys used to operate secure telephone

unites (STU IIIs);

(iii) Restricted Data as defined in the U.S. Atomic Energy Act of 1954, as amended;

(iv) Special Access Program (SAP) information; or

(v) Sensitive Compartmental Information (SCI).

(b) Prohibition on award. No contract under a national security program may be awarded to a company owned by an entity controlled by a foreign government if that company requires access to proscribed information to perform the contract, unless the Secretary of Defense or designee has waived application of 10 U.S.C.2536(a).

(c) Disclosure.

The Offeror shall disclose any interest a foreign government has in the Offeror when that interest constitutes control by a foreign government as defined in this provision. If the Offeror is a subsidiary, it shall also disclose any reportable interest a foreign government has in any entity that owns or controls the subsidiary, including reportable interest concerning the Offeror's immediate parent, intermediate parents, and the ultimate parent. Use separate paper as needed, and provide the information in the following format:

Offeror's Point of Contact for Questions about Disclosure

(Name and Phone Number with Country Code, City Code and Area Code, as applicable)

Name and Address of Offeror

Name and Address of Entity

Description of Interest, Controlled by a Foreign  
Ownership Percentage, and

Government Identification of Foreign Government

(End of provision)

#### 252.209-7003 COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (MAR 1998)

By submission of its offer, the offeror represents that, if it is subject to the reporting requirements of 37 U.S.C. 4212(d) (i.e., the VETS-100 report required by Federal Acquisition Regulation clause 52.222-37, Employment Reports on Disabled Veterans and Veterans of the Vietnam Era), it has submitted the most recent report required by 38 U.S.C. 4212(d).

#### 252.223-7001 HAZARD WARNING LABELS (DEC 1991)

(a) "Hazardous material," as used in this clause, is defined in the Hazardous Material Identification and Material Safety Data clause of this contract.

(b) The Contractor shall label the item package (unit container) of any hazardous material to be delivered under this contract in accordance with the Hazard Communication Standard (29 CFR 1910.1200 et seq). The Standard requires that the hazard warning label conform to the requirements of the standard unless the material is otherwise subject to the labeling requirements of one of the following statutes:

(1) Federal Insecticide, Fungicide and Rodenticide Act;

(2) Federal Food, Drug and Cosmetics Act;

(3) Consumer Product Safety Act;

(4) Federal Hazardous Substances Act; or

(5) Federal Alcohol Administration Act.

(c) The Offeror shall list which hazardous material listed in the Hazardous Material Identification and Material Safety Data clause of this contract will be labeled in accordance with one of the Acts in paragraphs (b)(1) through (5) of this clause instead of the Hazard Communication Standard. Any hazardous material not listed will be interpreted to mean that a label is required in accordance with the Hazard Communication Standard.

MATERIAL (If None, Insert "None.")

ACT

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(d) The apparently successful Offeror agrees to submit, before award, a copy of the hazard warning label for all hazardous materials not listed in paragraph (c) of this clause. The Offeror shall submit the label with the Material Safety Data Sheet being furnished under the Hazardous Material Identification and Material Safety Data clause of this contract.

(e) The Contractor shall also comply with MIL-STD-129, Marking for Shipment and Storage (including revisions adopted during the term of this contract).

(End of clause)

#### 252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) Definitions. As used in this clause --

(1) "Components" means articles, materials, and supplies incorporated directly into end products at any level of manufacture, fabrication, or assembly by the Contractor or any subcontractor.

(2) "Department of Defense" (DoD) means the Army, Navy, Air Force, Marine Corps, and defense agencies.

(3) "Foreign flag vessel" means any vessel that is not a U.S.-flag vessel.

(4) "Ocean transportation" means any transportation aboard a ship, vessel, boat, barge, or ferry through international waters.

(5) "Subcontractor" means a supplier, materialman, distributor, or vendor at any level below the prime contractor whose contractual obligation to perform results from, or is conditioned upon, award of the prime contract and who is performing any part of the work or other requirement of the prime contract.

(6) "Supplies" means all property, except land and interests in land, that is clearly identifiable for eventual use by or owned by the DoD at the time of transportation by sea.

(i) An item is clearly identifiable for eventual use by the DoD if, for example, the contract documentation contains a reference to a DoD contract number or a military destination.

(ii) "Supplies" includes (but is not limited to) public works; buildings and facilities; ships; floating equipment and vessels of every character, type, and description, with parts, subassemblies, accessories, and equipment; machine tools; material; equipment; stores of all kinds; end items; construction materials; and components of the foregoing.

(7) "U.S.-flag vessel" means a vessel of the United States or belonging to the United States, including any vessel registered or having national status under the laws of the United States.

(b)(1) The Contractor shall use U.S.-flag vessels when transporting any supplies by sea under this contract.

(2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessels if--

(i) This contract is a construction contract; or

(ii) The supplies being transported are--

(A) Noncommercial items; or

(B) Commercial items that--

(1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it contracts for f.o.b. destination shipment);

(2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or

(3) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

(c) The Contractor and its subcontractors may request that the Contracting Officer authorize shipment in foreign-flag vessels, or designate available U.S.-flag vessels, if the Contractor or a subcontractor believes that --

(1) U.S.-flag vessels are not available for timely shipment;

(2) The freight charges are inordinately excessive or unreasonable; or

(3) Freight charges are higher than charges to private persons for transportation of like goods.

(d) The Contractor must submit any request for use of other than U.S.-flag vessels in writing to the Contracting Officer at least 45 days prior to the sailing date necessary to meet its delivery schedules. The Contracting Officer will process requests submitted after such date(s) as expeditiously as possible, but the Contracting Officer's failure to grant approvals to meet the shipper's sailing date will not of itself constitute a compensable delay under this or any other clause of this contract. Requests shall contain at a minimum --

(1) Type, weight, and cube of cargo;

(2) Required shipping date;

(3) Special handling and discharge requirements;

(4) Loading and discharge points;

(5) Name of shipper and consignee;

(6) Prime contract number; and

(7) A documented description of efforts made to secure U.S.-flag vessels, including points of contact (with names and telephone numbers) with at least two U.S.-flag carriers contacted. Copies of telephone notes, telegraphic and facsimile message or letters will be sufficient for this purpose.

(e) The Contractor shall, within 30 days after each shipment covered by this clause, provide the Contracting Officer and the Division of National Cargo, Office of Market Development, Maritime Administration, U.S. Department of Transportation, Washington, DC 20590, one copy of the rated on board vessel operating carrier's ocean bill of lading, which shall contain the following information --

(1) Prime contract number;

- (2) Name of vessel;
- (3) Vessel flag of registry;
- (4) Date of loading;
- (5) Port of loading;
- (6) Port of final discharge;
- (7) Description of commodity;
- (8) Gross weight in pounds and cubic feet if available;
- (9) Total ocean freight in U.S. dollars; and
- (10) Name of the steamship company.

(f) The Contractor agrees to provide with its final invoice under this contract a representation that to the best of its knowledge and belief --

- (1) No ocean transportation was used in the performance of this contract;
- (2) Ocean transportation was used and only U.S.-flag vessels were used for all ocean shipments under the contract;
- (3) Ocean transportation was used, and the Contractor had the written consent of the Contracting Officer for all non-U.S.-flag ocean transportation; or
- (4) Ocean transportation was used and some or all of the shipments were made on non-U.S.-flag vessels without the written consent of the Contracting Officer. The Contractor shall describe these shipments in the following format:

ITEM DESCRIPTION	CONTRACT LINE ITEMS	QUANTITY
TOTAL		

(g) If the final invoice does not include the required representation, the Government will reject and return it to the Contractor as an improper invoice for the purposes of the Prompt Payment clause of this contract. In the event there has been unauthorized use of non-U.S.-flag vessels in the performance of this contract, the Contracting Officer is entitled to equitably adjust the contract, based on the unauthorized use.

(h) The Contractor shall include this clause, including this paragraph (h), in all subcontractors under this contract that--

- (1) Exceed the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation; and
  - (2) Are for a type of supplies described in paragraph (b)(3) of this clause.
- (End of clause)

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## SECTION 00700 Contract Clauses

## CLAUSES INCORPORATED BY FULL TEXT

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Contract Clauses**

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#### Successor Contracting Officers (52.201-4001)

The Contracting Officer who signed this contract is the primary Contracting Officer for the contract. Nevertheless, any Contracting Officer assigned to the Seattle District and acting within his/her authority may take formal action on this contract when a contract action needs to be taken and the primary Contracting Officer is unavailable.

#### 52.202-1 DEFINITIONS (MAY 2001) --ALTERNATE I (MAY 2001)

(a) Agency head or head of the agency means the Secretary (Attorney General, Administrator, Governor, Chairperson, or other chief official, as appropriate) of the agency, unless otherwise indicated, including any deputy or assistant chief official of the executive agency.

(b) "Commercial component" means any component that is a commercial item.

(c) Except as otherwise provided in this contract, the term "subcontracts" includes, but is not limited to, purchase orders and changes and modifications to purchase orders under this contract.

(d) Component means any item supplied to the Government as part of an end item or of another component, except that for use in 52.225-9, and 52.225-11 see the definitions in 52.225-9(a) and 52.225-11(a).

(e) Contracting Officer means a person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the Contracting Officer acting within the limits of their authority as delegated by the Contracting Officer.

(f) Nondevelopmental item means--

(1) Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement;

(2) Any item described in paragraph (f)(1) of this definition that requires only minor modification or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency; or

(3) Any item of supply being produced that does not meet the requirements of paragraph (f)(1) or (f)(2) solely because the item is not yet in use.

(End of clause)

#### 52.203-3 GRATUITIES (APR 1984)

(a) The right of the Contractor to proceed may be terminated by written notice if, after notice and hearing, the agency head or a designee determines that the Contractor, its agent, or another representative--

(1) Offered or gave a gratuity (e.g., an entertainment or gift) to an officer, official, or employee of the Government; and

(2) Intended, by the gratuity, to obtain a contract or favorable treatment under a contract.

(b) The facts supporting this determination may be reviewed by any court having lawful jurisdiction.

(c) If this contract is terminated under paragraph (a) of this clause, the Government is entitled--

(1) To pursue the same remedies as in a breach of the contract; and

(2) In addition to any other damages provided by law, to exemplary damages of not less than 3 nor more than 10 times the cost incurred by the Contractor in giving gratuities to the person concerned, as determined by the agency head or a designee. (This subparagraph (c)(2) is applicable only if this contract uses money appropriated to the Department of Defense.)

(d) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

(End of clause)

#### 52.203-5 COVENANT AGAINST CONTINGENT FEES (APR 1984)

(a) The Contractor warrants that no person or agency has been employed or retained to solicit or obtain this contract upon an agreement or understanding for a contingent fee, except a bona fide employee or agency. For breach or violation of this warranty, the Government shall have the right to annul this contract without liability or, in its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of the contingent fee.

(b) "Bona fide agency," as used in this clause, means an established commercial or selling agency, maintained by a contractor for the purpose of securing business, that neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds itself out as being able to obtain any Government contract or contracts through improper influence.

"Bona fide employee," as used in this clause, means a person, employed by a contractor and subject to the contractor's supervision and control as to time, place, and manner of performance, who neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds out as being able to obtain any Government contract or contracts through improper influence.

"Contingent fee," as used in this clause, means any commission, percentage, brokerage, or other fee that is contingent upon the success that a person or concern has in securing a Government contract.

"Improper influence," as used in this clause, means any influence that induces or tends to induce a Government employee or officer to give consideration or to act regarding a Government contract on any basis other than the merits of the matter.

(End of clause)

#### 52.203-7 ANTI-KICKBACK PROCEDURES. (JUL 1995)

##### (a) Definitions.

"Kickback," as used in this clause, means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided, directly or indirectly, to any prime Contractor, prime Contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a subcontract relating to a prime contract.

"Person," as used in this clause, means a corporation, partnership, business association of any kind, trust, joint-stock company, or individual.

"Prime contract," as used in this clause, means a contract or contractual action entered into by the United States for the purpose of obtaining supplies, materials, equipment, or services of any kind.

"Prime Contractor," as used in this clause, means a person who has entered into a prime contract with the United States.

"Prime Contractor employee," as used in this clause, means any officer, partner, employee, or agent of a prime Contractor.

"Subcontract," as used in this clause, means a contract or contractual action entered into by a prime Contractor or subcontractor for the purpose of obtaining supplies, materials, equipment, or services of any kind under a prime contract.

"Subcontractor," as used in this clause, (1) means any person, other than the prime Contractor, who offers to furnish or furnishes any supplies, materials, equipment, or services of any kind under a prime contract or a subcontract entered into in connection with such prime contract, and (2) includes any person who offers to furnish or furnishes general supplies to the prime Contractor or a higher tier subcontractor.

"Subcontractor employee," as used in this clause, means any officer, partner, employee, or agent of a subcontractor.

(b) The Anti-Kickback Act of 1986 (41 U.S.C. 51-58) (the Act), prohibits any person from -

(1) Providing or attempting to provide or offering to provide any kickback;

(2) Soliciting, accepting, or attempting to accept any kickback; or

(3) Including, directly or indirectly, the amount of any kickback in the contract price charged by a prime Contractor to the United States or in the contract price charged by a subcontractor to a prime Contractor or higher tier subcontractor.

(c)(1) The Contractor shall have in place and follow reasonable procedures designed to prevent and detect possible violations described in paragraph (b) of this clause in its own operations and direct business relationships.

(2) When the Contractor has reasonable grounds to believe that a violation described in paragraph (b) of this clause may have occurred, the Contractor shall promptly report in writing the possible violation. Such reports shall be made to the inspector general of the contracting agency, the head of the contracting agency if the agency does not have an inspector general, or the Department of Justice.

(3) The Contractor shall cooperate fully with any Federal agency investigating a possible violation described in paragraph (b) of this clause.

(4) The Contracting Officer may (i) offset the amount of the kickback against any monies owed by the United States under the prime contract and/or (ii) direct that the Prime Contractor withhold, from sums owed a subcontractor under the prime contract, the amount of any kickback. The Contracting Officer may order the monies withheld under subdivision (c)(4)(ii) of this clause be paid over to the Government unless the Government has already offset those monies under subdivision (c)(4)(i) of this clause. In either case, the Prime Contractor shall notify the Contracting Officer when the monies are withheld.

(5) The Contractor agrees to incorporate the substance of this clause, including this subparagraph (c)(5) but excepting subparagraph (c)(1), in all subcontracts under this contract which exceed \$100,000.

#### 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) If the Government receives information that a contractor or a person has engaged in conduct constituting a violation of subsection (a), (b), (c), or (d) of Section 27 of the Office of Federal Procurement Policy Act (41 U.S.C. 423) (the Act), as amended by section 4304 of the 1996 National Defense Authorization Act for Fiscal Year 1996 (Pub. L. 104-106), the Government may--

(1) Cancel the solicitation, if the contract has not yet been awarded or issued; or

(2) Rescind the contract with respect to which--

(i) The Contractor or someone acting for the Contractor has been convicted for an offense where the conduct constitutes a violation of subsection 27(a) or (b) of the Act for the purpose of either--

(A) Exchanging the information covered by such subsections for anything of value; or

(B) Obtaining or giving anyone a competitive advantage in the award of a Federal agency procurement contract; or

(ii) The head of the contracting activity has determined, based upon a preponderance of the evidence, that the Contractor or someone acting for the Contractor has engaged in conduct constituting an offense punishable under subsections 27(e)(1) of the Act.

(b) If the Government rescinds the contract under paragraph (a) of this clause, the Government is entitled to recover, in addition to any penalty prescribed by law, the amount expended under the contract.

(c) The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law, regulation, or under this contract.

(End of clause)

## 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) The Government, at its election, may reduce the price of a fixed-price type contract and the total cost and fee under a cost-type contract by the amount of profit or fee determined as set forth in paragraph (b) of this clause if the head of the contracting activity or designee determines that there was a violation of subsection 27 (a), (b), or (c) of the Office of Federal Procurement Policy Act, as amended (41 U.S.C. 423), as implemented in section 3.104 of the Federal Acquisition Regulation.

(b) The price or fee reduction referred to in paragraph (a) of this clause shall be--

(1) For cost-plus-fixed-fee contracts, the amount of the fee specified in the contract at the time of award;

(2) For cost-plus-incentive-fee contracts, the target fee specified in the contract at the time of award, notwithstanding any minimum fee or "fee floor" specified in the contract;

(3) For cost-plus-award-fee contracts--

(i) The base fee established in the contract at the time of contract award;

(ii) If no base fee is specified in the contract, 30 percent of the amount of each award fee otherwise payable to the Contractor for each award fee evaluation period or at each award fee determination point.

(4) For fixed-price-incentive contracts, the Government may--

(i) Reduce the contract target price and contract target profit both by an amount equal to the initial target profit specified in the contract at the time of contract award; or

(ii) If an immediate adjustment to the contract target price and contract target profit would have a significant adverse impact on the incentive price revision relationship under the contract, or adversely affect the contract financing provisions, the Contracting Officer may defer such adjustment until establishment of the total final price of the contract. The total final price established in accordance with the incentive price revision provisions of the contract shall be reduced by an amount equal to the initial target profit specified in the contract at the time of contract award and such reduced price shall be the total final contract price.

(5) For firm-fixed-price contracts, by 10 percent of the initial contract price or a profit amount determined by the Contracting Officer from records or documents in existence prior to the date of the contract award.

(c) The Government may, at its election, reduce a prime contractor's price or fee in accordance with the procedures of paragraph (b) of this clause for violations of the Act by its subcontractors by an amount not to exceed the amount of profit or fee reflected in the subcontract at the time the subcontract was first definitively priced.

(d) In addition to the remedies in paragraphs (a) and (c) of this clause, the Government may terminate this contract for default. The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law or under this contract.

(End of clause)

## 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 1997)

(a) Definitions.

"Agency," as used in this clause, means executive agency as defined in 2.101.

"Covered Federal action," as used in this clause, means any of the following Federal actions:

- (1) The awarding of any Federal contract.
- (2) The making of any Federal grant.
- (3) The making of any Federal loan.
- (4) The entering into of any cooperative agreement.
- (5) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

"Indian tribe" and "tribal organization," as used in this clause, have the meaning provided in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B) and include Alaskan Natives.

"Influencing or attempting to influence," as used in this clause, means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

"Local government," as used in this clause, means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

"Officer or employee of an agency," as used in this clause, includes the following individuals who are employed by an agency:

- (1) An individual who is appointed to a position in the Government under Title 5, United States Code, including a position under a temporary appointment.
- (2) A member of the uniformed services, as defined in subsection 101(3), Title 37, United States Code.
- (3) A special Government employee, as defined in section 202, Title 18, United States Code.
- (4) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, Title 5, United States Code, appendix 2.

"Person," as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State, and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Reasonable compensation," as used in this clause, means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

"Reasonable payment," as used in this clause, means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

"Recipient," as used in this clause, includes the Contractor and all subcontractors. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Regularly employed," as used in this clause, means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

"State," as used in this clause, means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or instrumentality of a State, and multi-State, regional, or interstate entity having governmental duties and powers.

(b) Prohibitions.

(1) Section 1352 of Title 31, United States Code, among other things, prohibits a recipient of a Federal contract, grant, loan, or cooperative agreement from using appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

(2) The Act also requires Contractors to furnish a disclosure if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

(3) The prohibitions of the Act do not apply under the following conditions:

(i) Agency and legislative liaison by own employees.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

(B) For purposes of subdivision (b)(3)(i)(A) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

(C) The following agency and legislative liaison activities are permitted at any time where they are not related to a specific solicitation for any covered Federal action:

(1) Discussing with an agency the qualities and characteristics (including individual demonstrations) of the person's products or services, conditions or terms of sale, and service capabilities.

(2) Technical discussions and other activities regarding the application or adaptation of the person's products or services for an agency's use.

(D) The following agency and legislative liaison activities are permitted where they are prior to formal solicitation of any covered Federal action--

(1) Providing any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;

(2) Technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and

(3) Capability presentations by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Pub. L. 95-507, and subsequent amendments.

(E) Only those services expressly authorized by subdivision (b)(3)(i)(A) of this clause are permitted under this clause.

(ii) Professional and technical services.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of--

(1) A payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action, if payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action.

(2) Any reasonable payment to a person, other than an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action if the payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action. Persons other than officers or employees of a person requesting or receiving a covered Federal action include consultants and trade associations.

(B) For purposes of subdivision (b)(3)(ii)(A) of this clause, "professional and technical services" shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

(C) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation and any other requirements in the actual award documents.

(D) Only those services expressly authorized by subdivisions (b)(3)(ii)(A)(1) and (2) of this clause are permitted under this clause.

(E) The reporting requirements of FAR 3.803(a) shall not apply with respect to payments of reasonable compensation made to regularly employed officers or employees of a person.

(c) Disclosure.

(1) The Contractor who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, OMB standard form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed

to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph (b)(1) of this clause, if paid for with appropriated funds.

(2) The Contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph (c)(1) of this clause. An event that materially affects the accuracy of the information reported includes--

(i) A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

(ii) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or

(iii) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(3) The Contractor shall require the submittal of a certification, and if required, a disclosure form by any person who requests or receives any subcontract exceeding \$100,000 under the Federal contract.

(4) All subcontractor disclosure forms (but not certifications) shall be forwarded from tier to tier until received by the prime Contractor. The prime Contractor shall submit all disclosures to the Contracting Officer at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor. Each subcontractor certification shall be retained in the subcontract file of the awarding Contractor.

(d) Agreement. The Contractor agrees not to make any payment prohibited by this clause.

(e) Penalties.

(1) Any person who makes an expenditure prohibited under paragraph (a) of this clause or who fails to file or amend the disclosure form to be filed or amended by paragraph (b) of this clause shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

(2) Contractors may rely without liability on the representation made by their subcontractors in the certification and disclosure form.

(f) Cost allowability. Nothing in this clause makes allowable or reasonable any costs which would otherwise be unallowable or unreasonable. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any other provision.

(End of clause)

52.204-4 PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)

(a) Definitions. As used in this clause--

“Postconsumer material” means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of “recovered material.” For paper and paper products, postconsumer material means “postconsumer fiber” defined by the U.S. Environmental Protection Agency (EPA) as--

(1) Paper, paperboard, and fibrous materials from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; or

- (2) All paper, paperboard, and fibrous materials that enter and are collected from municipal solid waste; but not
- (3) Fiber derived from printers' over-runs, converters' scrap, and over-issue publications.

"Printed or copied double-sided" means printing or reproducing a document so that information is on both sides of a sheet of paper.

"Recovered material," for paper and paper products, is defined by EPA in its Comprehensive Procurement Guideline as "recovered fiber" and means the following materials:

- (1) Postconsumer fiber; and
- (2) Manufacturing wastes such as--
  - (i) Dry paper and paperboard waste generated after completion of the papermaking process (that is, those manufacturing operations up to and including the cutting and trimming of the paper machine reel into smaller rolls or rough sheets) including: envelope cuttings, bindery trimmings, and other paper and paperboard waste resulting from printing, cutting, forming, and other converting operations; bag, box, and carton manufacturing wastes; and butt rolls, mill wrappers, and rejected unused stock; and
  - (ii) Repulped finished paper and paperboard from obsolete inventories of paper and paperboard manufacturers, merchants, wholesalers, dealers, printers, converters, or others.
- (b) In accordance with Section 101 of Executive Order 13101 of September 14, 1998, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition, the Contractor is encouraged to submit paper documents, such as offers, letters, or reports, that are printed or copied double-sided on recycled paper that meet minimum content standards specified in Section 505 of Executive Order 13101, when not using electronic commerce methods to submit information or data to the Government.
- (c) If the Contractor cannot purchase high-speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white wove envelopes, writing and office paper, book paper, cotton fiber paper, and cover stock meeting the 30 percent postconsumer material standard for use in submitting paper documents to the Government, it should use paper containing no less than 20 percent postconsumer material. This lesser standard should be used only when paper meeting the 30 percent postconsumer material standard is not obtainable at a reasonable price or does not meet reasonable performance standards.

(End of clause)

#### 52.209-6 PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)

- (a) The Government suspends or debar Contractors to protect the Government's interests. The Contractor shall not enter into any subcontract in excess of the \$25,000 with a Contractor that is debarred, suspended, or proposed for debarment unless there is a compelling reason to do so.
- (b) The Contractor shall require each proposed first-tier subcontractor, whose subcontract will exceed \$25,000, to disclose to the Contractor, in writing, whether as of the time of award of the subcontract, the subcontractor, or its principles, is or is not debarred, suspended, or proposed for debarment by the Federal Government.
- (c) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is debarred, suspended, or proposed for debarment (see FAR 9.404 for information on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs). The notice must include the following:
  - (1) The name of the subcontractor.

(2) The Contractor's knowledge of the reasons for the subcontractor being on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs.

(3) The compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs.

(4) The systems and procedures the Contractor has established to ensure that it is fully protecting the Government's interests when dealing with such subcontractor in view of the specific basis for the party's debarment, suspension, or proposed debarment.

(End of clause)

#### 52.211-13 TIME EXTENSIONS (SEP 2000)

Time extensions for contract changes will depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the contract completion date will be extended only for those specific elements related to the changed work and that the remaining contract completion dates for all other portions of the work will not be altered. The change order also may provide an equitable readjustment of liquidated damages under the new completion schedule.

(End of clause)

#### 52.212-4007 ENVIRONMENTAL LITIGATION

(a) If the performance of all or any part of the work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the Contracting Officer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a Subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the Contracting Officer in the administration of this contract under the terms of the "Suspension of Work" clause of this contract. The period of such suspension, delay or interruption shall be considered unreasonable, and an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

(b) The term "environmental litigation", as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Government has not duly considered, either substantially or procedurally, the effect of the work on the environment.

#### 52.215-2 AUDIT AND RECORDS--NEGOTIATION (JUN 1999)

(a) As used in this clause, "records" includes books, documents, accounting procedures and practices, and other data, regardless of type and regardless of whether such items are in written form, in the form of computer data, or in any other form.

(b) Examination of costs. If this is a cost-reimbursement, incentive, time-and-materials, labor-hour, or price redeterminable contract, or any combination of these, the Contractor shall maintain and the Contracting Officer, or an authorized representative of the Contracting Officer, shall have the right to examine and audit all records and other evidence sufficient to reflect properly all costs claimed to have been incurred or anticipated to be incurred directly or indirectly in performance of this contract. This right of examination shall include inspection at all

reasonable times of the Contractor's plants, or parts of them, engaged in performing the contract.

(c) Cost or pricing data. If the Contractor has been required to submit cost or pricing data in connection with any pricing action relating to this contract, the Contracting Officer, or an authorized representative of the Contracting Officer, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data, shall have the right to examine and audit all of the Contractor's records, including computations and projections, related to--

- (1) The proposal for the contract, subcontract, or modification;
- (2) The discussions conducted on the proposal(s), including those related to negotiating;
- (3) Pricing of the contract, subcontract, or modification; or
- (4) Performance of the contract, subcontract or modification.

(d) Comptroller General--(1) The Comptroller General of the United States, or an authorized representative, shall have access to and the right to examine any of the Contractor's directly pertinent records involving transactions related to this contract or a subcontract hereunder.

(2) This paragraph may not be construed to require the Contractor or subcontractor to create or maintain any record that the Contractor or subcontractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) Reports. If the Contractor is required to furnish cost, funding, or performance reports, the Contracting Officer or an authorized representative of the Contracting Officer shall have the right to examine and audit the supporting records and materials, for the purpose of evaluating (1) the effectiveness of the Contractor's policies and procedures to produce data compatible with the objectives of these reports and (2) the data reported.

(f) Availability. The Contractor shall make available at its office at all reasonable times the records, materials, and other evidence described in paragraphs (a), (b), (c), (d), and (e) of this clause, for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in Subpart 4.7, Contractor Records Retention, of the Federal Acquisition Regulation (FAR), or for any longer period required by statute or by other clauses of this contract. In addition--

(1) If this contract is completely or partially terminated, the Contractor shall make available the records relating to the work terminated until 3 years after any resulting final termination settlement; and

(2) The Contractor shall make available records relating to appeals under the Disputes clause or to litigation or the settlement of claims arising under or relating to this contract until such appeals, litigation, or claims are finally resolved.

(g) The Contractor shall insert a clause containing all the terms of this clause, including this paragraph (g), in all subcontracts under this contract that exceed the simplified acquisition threshold, and--

- (1) That are cost-reimbursement, incentive, time-and-materials, labor-hour, or price-redeterminable type or any combination of these;
- (2) For which cost or pricing data are required; or
- (3) That require the subcontractor to furnish reports as discussed in paragraph (e) of this clause.

The clause may be altered only as necessary to identify properly the contracting parties and the Contracting Officer under the Government prime contract.

(End of clause)

## 52.215-8 ORDER OF PRECEDENCE--UNIFORM CONTRACT FORMAT (OCT 1997)

Any inconsistency in this solicitation or contract shall be resolved by giving precedence in the following order:

- (a) The Schedule (excluding the specifications).
- (b) Representations and other instructions.
- (c) Contract clauses.
- (d) Other documents, exhibits, and attachments.
- (e) The specifications.

## 52.215-11 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA--MODIFICATIONS (OCT 1997)

(a) This clause shall become operative only for any modification to this contract involving a pricing adjustment expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, except that this clause does not apply to any modification if an exception under FAR 15.403-1 applies.

(b) If any price, including profit or fee, negotiated in connection with any modification under this clause, or any cost reimbursable under this contract, was increased by any significant amount because (1) the Contractor or a subcontractor furnished cost or pricing data that were not complete, accurate, and current as certified in its Certificate of Current Cost or Pricing Data, (2) a subcontractor or prospective subcontractor furnished the Contractor cost or pricing data that were not complete, accurate, and current as certified in the Contractor's Certificate of Current Cost or Pricing Data, or (3) any of these parties furnished data of any description that were not accurate, the price or cost shall be reduced accordingly and the contract shall be modified to reflect the reduction. This right to a price reduction is limited to that resulting from defects in data relating to modifications for which this clause becomes operative under paragraph (a) of this clause.

(c) Any reduction in the contract price under paragraph (b) of this clause due to defective data from a prospective subcontractor that was not subsequently awarded the subcontract shall be limited to the amount, plus applicable overhead and profit markup, by which--

(1) The actual subcontract; or

(2) The actual cost to the Contractor, if there was no subcontract, was less than the prospective subcontract cost estimate submitted by the Contractor; provided, that the actual subcontract price was not itself affected by defective cost or pricing data.

(d)(1) If the Contracting Officer determines under paragraph (b) of this clause that a price or cost reduction should be made, the Contractor agrees not to raise the following matters as a defense:

- (i) The Contractor or subcontractor was a sole source supplier or otherwise was in a superior bargaining position and thus the price of the contract would not have been modified even if accurate, complete, and current cost or pricing data had been submitted.
- (ii) The Contracting Officer should have known that the cost or pricing data in issue were defective even though the Contractor or subcontractor took no affirmative action to bring the character of the data to the attention of the Contracting Officer.

(iii) The contract was based on an agreement about the total cost of the contract and there was no agreement about the cost of each item procured under the contract.

(iv) The Contractor or subcontractor did not submit a Certificate of Current Cost or Pricing Data.

(2)(i) Except as prohibited by subdivision (d)(2)(ii) of this clause, an offset in an amount determined appropriate by the Contracting Officer based upon the facts shall be allowed against the amount of a contract price reduction if--

(A) The Contractor certifies to the Contracting Officer that, to the best of the Contractor's knowledge and belief, the Contractor is entitled to the offset in the amount requested; and

(B) The Contractor proves that the cost or pricing data were available before the "as of" date specified on its Certificate of Current Cost or Pricing Data, and that the data were not submitted before such date.

(ii) An offset shall not be allowed if--

(A) The understated data were known by the Contractor to be understated before the "as of" date specified on its Certificate of Current Cost or Pricing Data; or

(B) The Government proves that the facts demonstrate that the contract price would not have increased in the amount to be offset even if the available data had been submitted before the "as of" date specified on its Certificate of Current Cost or Pricing Data.

(e) If any reduction in the contract price under this clause reduces the price of items for which payment was made prior to the date of the modification reflecting the price reduction, the Contractor shall be liable to and shall pay the United States at the time such overpayment is repaid--

(1) Simple interest on the amount of such overpayment to be computed from the date(s) of overpayment to the Contractor to the date the Government is repaid by the Contractor at the applicable underpayment rate effective for each quarter prescribed by the Secretary of the Treasury under 26 U.S.C. 6621(a)(2); and

A penalty equal to the amount of the overpayment, if the Contractor or subcontractor knowingly submitted cost or pricing data that were incomplete, inaccurate, or noncurrent.

#### 52.215-13 SUBCONTRACTOR COST OR PRICING DATA--MODIFICATIONS (OCT 1997)

(a) The requirements of paragraphs (b) and (c) of this clause shall--

(1) Become operative only for any modification to this contract involving a pricing adjustment expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4; and

(2) Be limited to such modifications.

(b) Before awarding any subcontract expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, on the date of agreement on price or the date of award, whichever is later; or before pricing any subcontract modification involving a pricing adjustment expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless an exception under FAR 15.403-1 applies.

(c) The Contractor shall require the subcontractor to certify in substantially the form prescribed in FAR 15.406-2 that, to the best of its knowledge and belief, the data submitted under paragraph (b) of this clause were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract

modification.

The Contractor shall insert the substance of this clause, including this paragraph (d), in each subcontract that exceeds the threshold for submission of cost or pricing data at FAR 15.403-4 on the date of agreement on price or the date of award, whichever is later.

#### 52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2000)

(a) It is the policy of the United States that small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns shall have the maximum practicable opportunity to participate in performing contracts let by any Federal agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. It is further the policy of the United States that its prime contractors establish procedures to ensure the timely payment of amounts due pursuant to the terms of their subcontracts with small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns.

(b) The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with efficient contract performance. The Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of the Contractor's compliance with this clause.

Definitions. As used in this contract--

HUBZone small business concern means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

Small business concern means a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto.

Small disadvantaged business concern means a small business concern that represents, as part of its offer that--

(1) It has received certification as a small disadvantaged business concern consistent with 13 CFR part 124, subpart B;

(2) No material change in disadvantaged ownership and control has occurred since its certification;

(3) Where the concern is owned by one or more individuals, the net worth of each individual upon whom the certification is based does not exceed \$750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and

(4) It is identified, on the date of its representation, as a certified small disadvantaged business in the database maintained by the Small Business Administration (PRO-Net).

Veteran-owned small business concern means a small business concern--

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

Women-owned small business concern means a small business concern--

(1) That is at least 51 percent owned by one or more women, or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as a small business concern, a veteran-owned small business concern, a service-disabled veteran-owned small business concern, a HUBZone small business concern, a small disadvantaged business concern, or a women-owned small business concern.

(End of clause)

#### 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (OCT 2001)

(a) This clause does not apply to small business concerns.

(b) Definitions. As used in this clause--

Commercial item means a product or service that satisfies the definition of commercial item in section 2.101 of the Federal Acquisition Regulation.

Commercial plan means a subcontracting plan (including goals) that covers the offeror's fiscal year and that applies to the entire production of commercial items sold by either the entire company or a portion thereof (e.g., division, plant, or product line).

Individual contract plan means a subcontracting plan that covers the entire contract period (including option periods), applies to a specific contract, and has goals that are based on the offeror's planned subcontracting in support of the specific contract, except that indirect costs incurred for common or joint purposes may be allocated on a prorated basis to the contract.

Master plan means a subcontracting plan that contains all the required elements of an individual contract plan, except goals, and may be incorporated into individual contract plans, provided the master plan has been approved.

Subcontract means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(c) The offeror, upon request by the Contracting Officer, shall submit and negotiate a subcontracting plan, where applicable, that separately addresses subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business concerns, small disadvantaged business, and women-owned small business concerns. If the offeror is submitting an individual contract plan, the plan must separately address subcontracting with small business, veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns, with a separate part for the basic contract and separate parts for each option (if any). The plan shall be included in and made a part of the resultant contract. The subcontracting plan shall be negotiated within the time specified by the Contracting Officer. Failure to submit and negotiate the subcontracting plan shall make the offeror ineligible for award of a contract.

(d) The offeror's subcontracting plan shall include the following:

(1) Goals, expressed in terms of percentages of total planned subcontracting dollars, for the use of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns as subcontractors. Service-disabled veteran-owned small business concerns meet the definition of veteran-owned small business concerns, and offerors may include them within the subcontracting plan goal for veteran-owned small business concerns. A separate goal for service-disabled veteran-owned small business concerns is not required. The offeror shall include all subcontracts that contribute to contract performance, and may include a proportionate share of products and services that are normally allocated as indirect costs.

(2) A statement of--

(i) Total dollars planned to be subcontracted for an individual contract plan; or the offeror's total projected sales, expressed in dollars, and the total value of projected subcontracts to support the sales for a commercial plan;

(ii) Total dollars planned to be subcontracted to small business concerns;

(iii) Total dollars planned to be subcontracted to veteran-owned small business concerns;

(iv) Total dollars planned to be subcontracted to HUBZone small business concerns;

(v) Total dollars planned to be subcontracted to small disadvantaged business concerns; and

(vi) Total dollars planned to be subcontracted to women-owned small business concerns.

(3) A description of the principal types of supplies and services to be subcontracted, and an identification of the types planned for subcontracting to--

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) HUBZone small business concerns;

(iv) Small disadvantaged business concerns; and

(v) Women-owned small business concerns.

(4) A description of the method used to develop the subcontracting goals in paragraph (d)(1) of this clause.

(5) A description of the method used to identify potential sources for solicitation purposes (e.g., existing company source lists, the Procurement Marketing and Access Network (PRO-Net) of the Small Business Administration (SBA), veterans service organizations, the National Minority Purchasing Council Vendor Information Service, the Research and Information Division of the Minority Business Development Agency in the Department of Commerce,

or small, HUBZone, small disadvantaged, and women-owned small business trade associations). A firm may rely on the information contained in PRO-Net as an accurate representation of a concern's size and ownership characteristics for the purposes of maintaining a small, veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business source list. Use of PRO-Net as its source list does not relieve a firm of its responsibilities (e.g., outreach, assistance, counseling, or publicizing subcontracting opportunities) in this clause.

(6) A statement as to whether or not the offeror included indirect costs in establishing subcontracting goals, and a description of the method used to determine the proportionate share of indirect costs to be incurred with—

- (i) Small business concerns;
- (ii) Veteran-owned small business concerns;
- (iii) HUBZone small business concerns;
- (iv) Small disadvantaged business concerns; and
- (v) Women-owned small business concerns.

(7) The name of the individual employed by the offeror who will administer the offeror's subcontracting program, and a description of the duties of the individual.

(8) A description of the efforts the offeror will make to assure that small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business and women-owned small business concerns have an equitable opportunity to compete for subcontracts.

(9) Assurances that the offeror will include the clause of this contract entitled "Utilization of Small Business Concerns" in all subcontracts that offer further subcontracting opportunities, and that the offeror will require all subcontractors (except small business concerns) that receive subcontracts in excess of \$500,000 (\$1,000,000 for construction of any public facility) to adopt a subcontracting plan that complies with the requirements of this clause.

(10) Assurances that the offeror will--

- (i) Cooperate in any studies or surveys as may be required;
- (ii) Submit periodic reports so that the Government can determine the extent of compliance by the offeror with the subcontracting plan;
- (iii) Submit Standard Form (SF) 294, Subcontracting Report for Individual Contracts, and/or SF 295, Summary Subcontract Report, in accordance with paragraph (j) of this clause. The reports shall provide information on subcontract awards to small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, small disadvantaged business concerns, women-owned small business concerns, and Historically Black Colleges and Universities and Minority Institutions. Reporting shall be in accordance with the instructions on the forms or as provided in agency regulations.
- (iv) Ensure that its subcontractors agree to submit SF 294 and SF 295.

(11) A description of the types of records that will be maintained concerning procedures that have been adopted to comply with the requirements and goals in the plan, including establishing source lists; and a description of the offeror's efforts to locate small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns and award subcontracts to them. The records shall include at least the following (on a plant-wide or company-wide basis, unless otherwise indicated)

(i) Source lists (e.g., PRO-Net), guides, and other data that identify small business, veteran-owner small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns.

(ii) Organizations contacted in an attempt to locate sources that are small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business concerns.

(iii) Records on each subcontract solicitation resulting in an award of more than \$100,000, indicating--

(A) Whether small business concerns were solicited and, if not, why not;

(B) Whether veteran-owned small business concerns were solicited and, if not, why not;

(C) Whether HUBZone small business concerns were solicited and, if not, why not;

(D) Whether small disadvantaged business concerns were solicited and, if not, why not;

(E) Whether women-owned small business concerns were solicited and, if not, why not; and

(F) If applicable, the reason award was not made to a small business concern.

(iv) Records of any outreach efforts to contact--

(A) Trade associations;

(B) Business development organizations;

(C) Conferences and trade fairs to locate small, HUBZone small, small disadvantaged, and women-owned small business sources; and

(D) Veterans service organizations.

(v) Records of internal guidance and encouragement provided to buyers through--

(A) Workshops, seminars, training, etc.; and

(B) Monitoring performance to evaluate compliance with the program's requirements.

(vi) On a contract-by-contract basis, records to support award data submitted by the offeror to the Government, including the name, address, and business size of each subcontractor. Contractors having commercial plans need not comply with this requirement.

(e) In order to effectively implement this plan to the extent consistent with efficient contract performance, the Contractor shall perform the following functions:

(1) Assist small business, veteran-owner small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation by such concerns. Where the Contractor's lists of potential small business, veteran-owner small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business subcontractors are excessively long, reasonable effort shall be made to give all such small business concerns an opportunity to compete over a period of time.

- (2) Provide adequate and timely consideration of the potentialities of small business, veteran-owner small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns in all "make-or-buy" decisions.
- (3) Counsel and discuss subcontracting opportunities with representatives of small business, veteran-owner small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business firms.
- (4) Provide notice to subcontractors concerning penalties and remedies for misrepresentations of business status as small, veteran-owner small business, HUBZone small, small disadvantaged, or women-owned small business for the purpose of obtaining a subcontract that is to be included as part or all of a goal contained in the Contractor's subcontracting plan.
- (f) A master plan on a plant or division-wide basis that contains all the elements required by paragraph (d) of this clause, except goals, may be incorporated by reference as a part of the subcontracting plan required of the offeror by this clause; provided--
- (1) the master plan has been approved, (2) the offeror ensures that the master plan is updated as necessary and provides copies of the approved master plan, including evidence of its approval, to the Contracting Officer, and (3) goals and any deviations from the master plan deemed necessary by the Contracting Officer to satisfy the requirements of this contract are set forth in the individual subcontracting plan.
- (g) A commercial plan is the preferred type of subcontracting plan for contractors furnishing commercial items. The commercial plan shall relate to the offeror's planned subcontracting generally, for both commercial and Government business, rather than solely to the Government contract. Commercial plans are also preferred for subcontractors that provide commercial items under a prime contract, whether or not the prime contractor is supplying a commercial item.
- (h) Prior compliance of the offeror with other such subcontracting plans under previous contracts will be considered by the Contracting Officer in determining the responsibility of the offeror for award of the contract.
- (i) The failure of the Contractor or subcontractor to comply in good faith with (1) the clause of this contract entitled "Utilization Of Small Business Concerns," or (2) an approved plan required by this clause, shall be a material breach of the contract.
- (j) The Contractor shall submit the following reports:
- (1) Standard Form 294, Subcontracting Report for Individual Contracts. This report shall be submitted to the Contracting Officer semiannually and at contract completion. The report covers subcontract award data related to this contract. This report is not required for commercial plans.
- (2) Standard Form 295, Summary Subcontract Report. This report encompasses all of the contracts with the awarding agency. It must be submitted semi-annually for contracts with the Department of Defense and annually for contracts with civilian agencies. If the reporting activity is covered by a commercial plan, the reporting activity must report annually all subcontract awards under that plan. All reports submitted at the close of each fiscal year (both individual and commercial plans) shall include a breakout, in the Contractor's format, of subcontract awards, in whole dollars, to small disadvantaged business concerns by North American Industry Classification System (NAICS) Industry Subsector. For a commercial plan, the Contractor may obtain from each of its subcontractors a predominant NAICS Industry Subsector and report all awards to that subcontractor under its predominant NAICS Industry Subsector.

(End of clause)

(a) Failure to make a good faith effort to comply with the subcontracting plan, as used in this clause, means a willful or intentional failure to perform in accordance with the requirements of the subcontracting plan approved under the clause in this contract entitled "Small Business Subcontracting Plan," or willful or intentional action to frustrate the plan.

(b) Performance shall be measured by applying the percentage goals to the total actual subcontracting dollars or, if a commercial plan is involved, to the pro rata share of actual subcontracting dollars attributable to Government contracts covered by the commercial plan. If, at contract completion or, in the case of a commercial plan, at the close of the fiscal year for which the plan is applicable, the Contractor has failed to meet its subcontracting goals and the Contracting Officer decides in accordance with paragraph (c) of this clause that the Contractor failed to make a good faith effort to comply with its subcontracting plan, established in accordance with the clause in this contract entitled "Small Business Subcontracting Plan," the Contractor shall pay the Government liquidated damages in an amount stated. The amount of probable damages attributable to the Contractor's failure to comply shall be an amount equal to the actual dollar amount by which the Contractor failed to achieve each subcontract goal.

(c) Before the Contracting Officer makes a final decision that the Contractor has failed to make such good faith effort, the Contracting Officer shall give the Contractor written notice specifying the failure and permitting the Contractor to demonstrate what good faith efforts have been made and to discuss the matter. Failure to respond to the notice may be taken as an admission that no valid explanation exists. If, after consideration of all the pertinent data, the Contracting Officer finds that the Contractor failed to make a good faith effort to comply with the subcontracting plan, the Contracting Officer shall issue a final decision to that effect and require that the Contractor pay the Government liquidated damages as provided in paragraph (b) of this clause.

(d) With respect to commercial plans, the Contracting Officer who approved the plan will perform the functions of the Contracting Officer under this clause on behalf of all agencies with contracts covered by the commercial plan.

(e) The Contractor shall have the right of appeal, under the clause in this contract entitled Disputes, from any final decision of the Contracting Officer.

(f) Liquidated damages shall be in addition to any other remedies that the Government may have.

(End of clause)

#### 52.219-25 SMALL DISADVANTAGED BUSINESS PARTICIPATION PROGRAM—DISADVANTAGED STATUS AND REPORTING (OCT 1999)

(a) Disadvantaged status for joint venture partners, team members, and subcontractors. This clause addresses disadvantaged status for joint venture partners, teaming arrangement members, and subcontractors and is applicable if this contract contains small disadvantaged business (SDB) participation targets. The Contractor shall obtain representations of small disadvantaged status from joint venture partners, teaming arrangement members, and subcontractors through use of a provision substantially the same as paragraph (b)(1)(i) of the provision at FAR 52.219-22, Small Disadvantaged Business Status. The Contractor shall confirm that a joint venture partner, team member, or subcontractor representing itself as a small disadvantaged business concern, is identified as a certified small disadvantaged business in the database maintained by the Small Business Administration (PRO-Net) or by contacting the SBA's Office of Small Disadvantaged Business Certification and Eligibility.

(b) Reporting requirement. If this contract contains SDB participation targets, the Contractor shall report on the participation of SDB concerns at contract completion, or as otherwise provided in this contract. Reporting may be on Optional Form 312, Small Disadvantaged Business Participation Report, or in the Contractor's own format providing the same information. This report is required for each contract containing SDB participation targets. If this contract contains an individual Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan, reports may be submitted with the final Subcontracting Report for Individual Contracts (Standard Form 294) at the completion of the contract.

(End of clause)

## 52.222-1 NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)

If the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately give notice, including all relevant information, to the Contracting Officer.

## 52.222-3 CONVICT LABOR (AUG 1996)

The Contractor agrees not to employ in the performance of this contract any person undergoing a sentence of imprisonment which has been imposed by any court of a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands. This limitation, however, shall not prohibit the employment by the Contractor in the performance of this contract of persons on parole or probation to work at paid employment during the term of their sentence or persons who have been pardoned or who have served their terms. Nor shall it prohibit the employment by the Contractor in the performance of this contract of persons confined for violation of the laws of any of the States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands who are authorized to work at paid employment in the community under the laws of such jurisdiction, if--

- (a)(1) The worker is paid or is in an approved work training program on a voluntary basis;
  - (2) Representatives of local union central bodies or similar labor union organizations have been consulted;
  - (3) Such paid employment will not result in the displacement of employed workers, or be applied in skills, crafts, or trades in which there is a surplus of available gainful labor in the locality, or impair existing contracts for services; and
  - (4) The rates of pay and other conditions of employment will not be less than those paid or provided for work of a similar nature in the locality in which the work is being performed; and
- (b) The Attorney General of the United States has certified that the work-release laws or regulations of the jurisdiction involved are in conformity with the requirements of Executive Order 11755, as amended by Executive Orders 12608 and 12943.

(End of clause)

## 52.222-4 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT - OVERTIME COMPENSATION. (SEP 2000)

(a) Overtime requirements. No Contractor or subcontractor employing laborers or mechanics (see Federal Acquisition Regulation 22.300) shall require or permit them to work over 40 hours in any workweek unless they are paid at least 1 and 1/2 times the basic rate of pay for each hour worked over 40 hours.

(b) Violation; liability for unpaid wages; liquidated damages. The responsible Contractor and subcontractor are liable for unpaid wages if they violate the terms in paragraph (a) of this clause. In addition, the Contractor and subcontractor are liable for liquidated damages payable to the Government. The Contracting Officer will assess liquidated damages at the rate of \$10 per affected employee for each calendar day on which the employer required or permitted the employee to work in excess of the standard workweek of 40 hours without paying overtime wages required by the Contract Work Hours and Safety Standards Act.

(c) Withholding for unpaid wages and liquidated damages. The Contracting Officer will withhold from payments due under the contract sufficient funds required to satisfy any Contractor or subcontractor liabilities for unpaid

wages and liquidated damages. If amounts withheld under the contract are insufficient to satisfy Contractor or subcontractor liabilities, the Contracting Officer will withhold payments from other Federal or Federally assisted contracts held by the same Contractor that are subject to the Contract Work Hours and Safety Standards Act.

(d) Payrolls and basic records.

(1) The Contractor and its subcontractors shall maintain payrolls and basic payroll records for all laborers and mechanics working on the contract during the contract and shall make them available to the Government until 3 years after contract completion. The records shall contain the name and address of each employee, social security number, labor classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. The records need not duplicate those required for construction work by Department of Labor regulations at 29 CFR 5.5(a)(3) implementing the Davis-Bacon Act.

(2) The Contractor and its subcontractors shall allow authorized representatives of the Contracting Officer or the Department of Labor to inspect, copy, or transcribe records maintained under paragraph (d)(1) of this clause. The Contractor or subcontractor also shall allow authorized representatives of the Contracting Officer or Department of Labor to interview employees in the workplace during working hours.

(e) Subcontracts. The Contractor shall insert the provisions set forth in paragraphs (a) through (d) of this clause in subcontracts exceeding \$100,000 and require subcontractors to include these provisions in any lower tier subcontracts. The Contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the provisions set forth in paragraphs (a) through (d) of this clause.

(End of clause)

52.222-6 DAVIS-BACON ACT (FEB 1995)

(a) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (d) of this clause; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such period. Such laborers and mechanics shall be paid not less than the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in the clause entitled Apprentices and Trainees. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph (b) of this clause) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(b)(1) The Contracting Officer shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The Contracting Officer shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination.

(ii) The classification is utilized in the area by the construction industry.

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the Contracting Officer agree on the classification and wage rate (including the amount designated for fringe benefits, where appropriate), a report of the action taken shall be sent by the Contracting Officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator or an authorized representative will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(3) In the event the Contractor, the laborers or mechanics to be employed in the classification, or their representatives, and the Contracting Officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the Contracting Officer shall refer the questions, including the views of all interested parties and the recommendation of the Contracting Officer, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits, where appropriate) determined pursuant to subparagraphs (b)(2) and (b)(3) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(c) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(d) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, That the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

#### 52.222-7 WITHHOLDING OF FUNDS (FEB 1988)

The Contracting Officer shall, upon his or her own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same Prime Contractor, or any other Federally assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same Prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

#### 52.222-8 PAYROLLS AND BASIC RECORDS (FEB 1988)

(a) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of 3 years thereafter for all laborers and mechanics working at the site of the work. Such

records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under paragraph (d) of the clause entitled Davis-Bacon Act, that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(b)(1) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under paragraph (a) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The Prime Contractor is responsible for the submission of copies of payrolls by all subcontractors.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify--

(i) That the payroll for the payroll period contains the information required to be maintained under paragraph (a) of this clause and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR Part 3; and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph (b)(2) of this clause.

(4) The falsification of any of the certifications in this clause may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.

(c) The Contractor or subcontractor shall make the records required under paragraph (a) of this clause available for inspection, copying, or transcription by the Contracting Officer or authorized representatives of the Contracting Officer or the Department of Labor. The Contractor or subcontractor shall permit the Contracting Officer or representatives of the Contracting Officer or the Department of Labor to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit required records or to make them available, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(a) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(b) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(c) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.

#### 52.222-11 SUBCONTRACTS (LABOR STANDARDS (FEB 1988)

(a) The Contractor or subcontractor shall insert in any subcontracts the clauses entitled Davis-Bacon Act, Contract Work Hours and Safety Standards Act-Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Withholding of Funds, Subcontracts (Labor Standards), Contract Termination-Debarment, Disputes Concerning Labor Standards, Compliance with Davis-Bacon and Related Act Regulations, and Certification of Eligibility, and such other clauses as the Contracting Officer may, by appropriate instructions, require, and also a clause requiring subcontractors to include these clauses in any lower tier subcontracts. The Prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with all the contract clauses cited in this paragraph.

(b)(1) Within 14 days after award of the contract, the Contractor shall deliver to the Contracting Officer a completed Statement and Acknowledgment Form (SF 1413) for each subcontract, including the subcontractor's signed and dated acknowledgment that the clauses set forth in paragraph (a) of this clause have been included in the subcontract.

(2) Within 14 days after the award of any subsequently awarded subcontract the Contractor shall deliver to the Contracting Officer an updated completed SF 1413 for such additional subcontract.

#### 52.222-12 CONTRACT TERMINATION--DEBARMENT (FEB 1988)

A breach of the contract clauses entitled Davis-Bacon Act, Contract Work Hours and Safety Standards Act--Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Subcontracts (Labor Standards), Compliance with Davis-Bacon and Related Act Regulations, or Certification of Eligibility may be grounds for termination of the contract, and for debarment as a Contractor and subcontractor as provided in 29 CFR 5.12.

#### 52.222-13 COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are hereby incorporated by reference in this contract.

#### 52.222-14 DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)

The United States Department of Labor has set forth in 29 CFR Parts 5, 6, and 7 procedures for resolving disputes concerning labor standards requirements. Such disputes shall be resolved in accordance with those procedures and not the Disputes clause of this contract. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

#### 52.222-15 CERTIFICATION OF ELIGIBILITY (FEB 1988)

(a) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(b) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government

contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(c) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

#### 52.222-21 PROHIBITION OF SEGREGATED FACILITIES (FEB 1999)

(a) Segregated facilities, as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(b) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

(End of clause)

#### 52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade	Goals for female participation for each trade
STATE COUNTY %	
MT CASCADE 3.2%	6.9%

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the --

- (1) Name, address, and telephone number of the subcontractor;
- (2) Employer's identification number of the subcontractor;
- (3) Estimated dollar amount of the subcontract;
- (4) Estimated starting and completion dates of the subcontract; and
- (5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is [Contracting Officer shall insert description of the geographical areas where the contract is to be performed, giving the State, county, and city].

#### 52.222-26 EQUAL OPPORTUNITY (FEB 1999)

(a) If, during any 12-month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of \$10,000, the Contractor shall comply with subparagraphs (b)(1) through (11) of this clause. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.

(b) During performing this contract, the Contractor agrees as follows:

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. However, it shall not be a violation of this clause for the Contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation, in connection with employment opportunities on or near an Indian reservation, as permitted by 41 CFR 60-1.5.

(2) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. This shall include, but not be limited to, (i) employment, (ii) upgrading, (iii) demotion, (iv) transfer, (v) recruitment or recruitment advertising, (vi) layoff or termination, (vii) rates of pay or other forms of compensation, and (viii) selection for training, including apprenticeship.

(3) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(4) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(5) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(6) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(7) The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. The Contractor shall also file Standard Form 100 (EEO-1), or any successor form, as prescribed in 41 CFR part 60-1. Unless the Contractor has filed within the 12 months preceding the date of contract award, the Contractor shall, within 30 days after contract award, apply to either the regional Office of Federal Contract Compliance Programs (OFCCP) or the local office of the Equal Employment Opportunity Commission for the necessary forms.

(8) The Contractor shall permit access to its premises, during normal business hours, by the contracting agency or the OFCCP for the purpose of conducting on-site compliance evaluations and complaint investigations. The Contractor shall permit the Government to inspect and copy any books, accounts, records (including computerized records), and other material that may be relevant to the matter under investigation and pertinent to compliance with Executive Order 11246, as amended, and rules and regulations that implement the Executive Order.

(9) If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended; in the rules, regulations, and orders of the Secretary of Labor; or as otherwise provided by law.

(10) The Contractor shall include the terms and conditions of subparagraphs (b)(1) through (11) of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

(11) The Contractor shall take such action with respect to any subcontract or purchase order as the contracting officer may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance; provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of any direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(c) Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60-1.1.

(End of clause)

#### 52.222-27 AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (FEB 1999)

(a) Definitions. "Covered area," as used in this clause, means the geographical area described in the solicitation for this contract.

"Deputy Assistant Secretary," as used in this clause, means Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, or a designee.

"Employer's identification number," as used in this clause, means the Federal Social Security number used on the employer's quarterly federal tax return, U.S. Treasury Department Form 941.

"Minority," as used in this clause, means--

(1) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

(2) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands);

(3) Black (all persons having origins in any of the black African racial groups not of Hispanic origin); and

(4) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).

(b) If the Contractor, or a subcontractor at any tier, subcontracts a portion of the work involving any construction trade, each such subcontract in excess of \$10,000 shall include this clause and the Notice containing the goals for minority and female participation stated in the solicitation for this contract.

(c) If the Contractor is participating in a Hometown Plan (41 CFR 60-4) approved by the U.S. Department of Labor in a covered area, either individually or through an association, its affirmative action obligations on all work in the plan area (including goals) shall comply with the plan for those trades that have unions participating in the plan. Contractors must be able to demonstrate participation in, and compliance with, the provisions of the plan. Each Contractor or subcontractor participating in an approved plan is also required to comply with its obligations under the Equal Opportunity clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good-faith performance by other Contractors or subcontractors toward a goal in an approved plan does not excuse any Contractor's or subcontractor's failure to make good-faith efforts to achieve the plan's goals.

(d) The Contractor shall implement the affirmative action procedures in subparagraphs (g)(1) through (16) of this clause. The goals stated in the solicitation for this contract are expressed as percentages of the total hours of employment and training of minority and female utilization that the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where that work is actually performed. The Contractor is expected to make substantially uniform progress toward its goals in each craft.

(e) Neither the terms and conditions of any collective bargaining agreement, nor the failure by a union with which the Contractor has a collective bargaining agreement, to refer minorities or women shall excuse the Contractor's obligations under this clause, Executive Order 11246, as amended, or the regulations thereunder.

(f) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

(g) The Contractor shall take affirmative action to ensure equal employment opportunity. The evaluation of the Contractor's compliance with this clause shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and implement affirmative action steps at least as extensive as the following:

(1) Ensure a working environment free of harassment, intimidation, and coercion at all sites and in all facilities where the Contractor's employees are assigned to work. The Contractor, if possible, will assign two or more women to each construction project. The Contractor shall ensure that foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at these sites or facilities.

(2) Establish and maintain a current list of sources for minority and female recruitment. Provide written notification to minority and female recruitment sources and community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

(3) Establish and maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant, referrals of minorities or females from unions, recruitment sources, or community organizations, and the action taken with respect to each individual. If an individual was sent to the union hiring hall

for referral and not referred back to the Contractor by the union or, if referred back, not employed by the Contractor, this shall be documented in the file, along with whatever additional actions the Contractor may have taken.

(4) Immediately notify the Deputy Assistant Secretary when the union or unions with which the Contractor has a collective bargaining agreement has not referred back to the Contractor a minority or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

(5) Develop on-the-job training opportunities and/or participate in training programs for the area that expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under subparagraph (g)(2) of this clause.

(6) Disseminate the Contractor's equal employment policy by--

(i) Providing notice of the policy to unions and to training, recruitment, and outreach programs, and requesting their cooperation in assisting the Contractor in meeting its contract obligations;

(ii) Including the policy in any policy manual and in collective bargaining agreements;

(iii) Publicizing the policy in the company newspaper, annual report, etc.;

(iv) Reviewing the policy with all management personnel and with all minority and female employees at least once a year; and

(v) Posting the policy on bulletin boards accessible to employees at each location where construction work is performed.

(7) Review, at least annually, the Contractor's equal employment policy and affirmative action obligations with all employees having responsibility for hiring, assignment, layoff, termination, or other employment decisions. Conduct review of this policy with all on-site supervisory personnel before initiating construction work at a job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

(8) Disseminate the Contractor's equal employment policy externally by including it in any advertising in the news media, specifically including minority and female news media. Provide written notification to, and discuss this policy with, other Contractors and subcontractors with which the Contractor does or anticipates doing business.

(9) Direct recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students, and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than 1 month before the date for acceptance of applications for apprenticeship or training by any recruitment source, send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

(10) Encourage present minority and female employees to recruit minority persons and women. Where reasonable, provide after-school, summer, and vacation employment to minority and female youth both on the site and in other areas of the Contractor's workforce.

(11) Validate all tests and other selection requirements where required under 41 CFR 60-3.

(12) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities. Encourage these employees to seek or to prepare for, through appropriate training, etc., opportunities for promotion.

(13) Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the Contractor's obligations under this contract are being carried out.

(14) Ensure that all facilities and company activities are nonsegregated except that separate or single-user rest rooms and necessary dressing or sleeping areas shall be provided to assure privacy between the sexes.

(15) Maintain a record of solicitations for subcontracts for minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

(16) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's equal employment policy and affirmative action obligations.

(h) The Contractor is encouraged to participate in voluntary associations that may assist in fulfilling one or more of the affirmative action obligations contained in subparagraphs (g)(1) through (16) of this clause. The efforts of a contractor association, joint contractor-union, contractor-community, or similar group of which the contractor is a member and participant may be asserted as fulfilling one or more of its obligations under subparagraphs (g)(1) through (16) of this clause, provided the Contractor--

(1) Actively participates in the group;

(2) Makes every effort to ensure that the group has a positive impact on the employment of minorities and women in the industry;

(3) Ensures that concrete benefits of the program are reflected in the Contractor's minority and female workforce participation;

(4) Makes a good-faith effort to meet its individual goals and timetables; and

(5) Can provide access to documentation that demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply is the Contractor's, and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

(i) A single goal for minorities and a separate single goal for women shall be established. The Contractor is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and nonminority. Consequently, the Contractor may be in violation of Executive Order 11246, as amended, if a particular group is employed in a substantially disparate manner.

(j) The Contractor shall not use goals or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

(k) The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts under Executive Order 11246, as amended.

(l) The Contractor shall carry out such sanctions and penalties for violation of this clause and of the Equal Opportunity clause, including suspension, termination, and cancellation of existing subcontracts, as may be imposed or ordered under Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any failure to carry out these sanctions and penalties as ordered shall be a violation of this clause and Executive Order 11246, as amended.

(m) The Contractor in fulfilling its obligations under this clause shall implement affirmative action procedures at least as extensive as those prescribed in paragraph (g) of this clause, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of Executive Order 11246, as amended, the implementing regulations, or this clause, the Deputy Assistant Secretary shall take

action as prescribed in 41 CFR 60-4.8.

(n) The Contractor shall designate a responsible official to--

(1) Monitor all employment-related activity to ensure that the Contractor's equal employment policy is being carried out;

(2) Submit reports as may be required by the Government; and

(3) Keep records that shall at least include for each employee the name, address, telephone number, construction trade, union affiliation (if any), employee identification number, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, separate records are not required to be maintained.

Nothing contained herein shall be construed as a limitation upon the application of other laws that establish different standards of compliance or upon the requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

#### 52.222-35 EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) Definitions. As used in this clause--

All employment openings means all positions except executive and top management, those positions that will be filled from within the Contractor's organization, and positions lasting 3 days or less. This term includes full-time employment, temporary employment of more than 3 days duration, and part-time employment.

Executive and top management means any employee--

(1) Whose primary duty consists of the management of the enterprise in which the individual is employed or of a customarily recognized department or subdivision thereof;

(2) Who customarily and regularly directs the work of two or more other employees;

(3) Who has the authority to hire or fire other employees or whose suggestions and recommendations as to the hiring or firing and as to the advancement and promotion or any other change of status of other employees will be given particular weight;

(4) Who customarily and regularly exercises discretionary powers; and

(5) Who does not devote more than 20 percent or, in the case of an employee of a retail or service establishment, who does not devote more than 40 percent of total hours of work in the work week to activities that are not directly and closely related to the performance of the work described in paragraphs (1) through (4) of this definition. This paragraph (5) does not apply in the case of an employee who is in sole charge of an establishment or a physically separated branch establishment, or who owns at least a 20 percent interest in the enterprise in which the individual is employed.

Other eligible veteran means any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized.

Positions that will be filled from within the Contractor's organization means employment openings for which the Contractor will give no consideration to persons outside the Contractor's organization (including any affiliates, subsidiaries, and parent companies) and includes any openings the Contractor proposes to fill from regularly

established “recall” lists. The exception does not apply to a particular opening once an employer decides to consider applicants outside of its organization.

Qualified special disabled veteran means a special disabled veteran who satisfies the requisite skill, experience, education, and other job-related requirements of the employment position such veteran holds or desires, and who, with or without reasonable accommodation, can perform the essential functions of such position.

Special disabled veteran means--

(1) A veteran who is entitled to compensation (or who but for the receipt of military retired pay would be entitled to compensation) under laws administered by the Department of Veterans Affairs for a disability--

(i) Rated at 30 percent or more; or

(ii) Rated at 10 or 20 percent in the case of a veteran who has been determined under 38 U.S.C. 3106 to have a serious employment handicap (i.e., a significant impairment of the veteran's ability to prepare for, obtain, or retain employment consistent with the veteran's abilities, aptitudes, and interests); or

(2) A person who was discharged or released from active duty because of a service-connected disability.

Veteran of the Vietnam era means a person who--

(1) Served on active duty for a period of more than 180 days and was discharged or released from active duty with other than a dishonorable discharge, if any part of such active duty occurred--

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases; or

(2) Was discharged or released from active duty for a service-connected disability if any part of the active duty was performed--

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases.

(b) General. (1) The Contractor shall not discriminate against the individual because the individual is a special disabled veteran, a veteran of the Vietnam era, or other eligible veteran, regarding any position for which the employee or applicant for employment is qualified. The Contractor shall take affirmative action to employ, advance in employment, and otherwise treat qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans without discrimination based upon their disability or veterans' status in all employment practices such as--

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff and rehiring;

(iii) Rate of pay or any other form of compensation and changes in compensation;

(iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeship, and on-the-job training under 38 U.S.C. 3687, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor including social or recreational programs; and

(ix) Any other term, condition, or privilege of employment.

(2) The Contractor shall comply with the rules, regulations, and relevant orders of the Secretary of Labor issued under the Vietnam Era Veterans' Readjustment Assistance Act of 1972 (the Act), as amended (38 U.S.C. 4211 and 4212).

(c) Listing openings. (1) The Contractor shall immediately list all employment openings that exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by this contract, and including those occurring at an establishment of the Contractor other than the one where the contract is being performed, but excluding those of independently operated corporate affiliates, at an appropriate local public employment service office of the State wherein the opening occurs. Listing employment openings with the U.S. Department of Labor's America's Job Bank shall satisfy the requirement to list jobs with the local employment service office.

(2) The Contractor shall make the listing of employment openings with the local employment service office at least concurrently with using any other recruitment source or effort and shall involve the normal obligations of placing a bona fide job order, including accepting referrals of veterans and nonveterans. This listing of employment openings does not require hiring any particular job applicant or hiring from any particular group of job applicants and is not intended to relieve the Contractor from any requirements of Executive orders or regulations concerning nondiscrimination in employment.

(3) Whenever the Contractor becomes contractually bound to the listing terms of this clause, it shall advise the State public employment agency in each State where it has establishments of the name and location of each hiring location in the State. As long as the Contractor is contractually bound to these terms and has so advised the State agency, it need not advise the State agency of subsequent contracts. The Contractor may advise the State agency when it is no longer bound by this contract clause.

(d) Applicability. This clause does not apply to the listing of employment openings that occur and are filled outside the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, Guam, the Virgin Islands of the United States, and Wake Island.

(e) Postings. (1) The Contractor shall post employment notices in conspicuous places that are available to employees and applicants for employment.

(2) The employment notices shall--

(i) State the rights of applicants and employees as well as the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified employees and applicants who are special disabled veterans, veterans of the Vietnam era, and other eligible veterans; and

(ii) Be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance Programs, Department of Labor (Deputy Assistant Secretary of Labor), and provided by or through the Contracting Officer.

(3) The Contractor shall ensure that applicants or employees who are special disabled veterans are informed of the contents of the notice (e.g., the Contractor may have the notice read to a visually disabled veteran, or may lower the posted notice so that it can be read by a person in a wheelchair).

(4) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement, or other contract understanding, that the Contractor is bound by the terms of the Act and is committed to take affirmative action to employ, and advance in employment, qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans.

(f) Noncompliance. If the Contractor does not comply with the requirements of this clause, the Government may take appropriate actions under the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(g) Subcontracts. The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of \$25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor. The Contractor shall act as specified by the Deputy Assistant Secretary of Labor to enforce the terms, including action for noncompliance.

(End of clause)

#### 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

(a) General. (1) Regarding any position for which the employee or applicant for employment is qualified, the Contractor shall not discriminate against any employee or applicant because of physical or mental disability. The Contractor agrees to take affirmative action to employ, advance in employment, and otherwise treat qualified individuals with disabilities without discrimination based upon their physical or mental disability in all employment practices such as--

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff, and rehiring;

(iii) Rates of pay or any other form of compensation and changes in compensation;

(iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeships, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor, including social or recreational programs; and

(ix) Any other term, condition, or privilege of employment.

(2) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor (Secretary) issued under the Rehabilitation Act of 1973 (29 U.S.C. 793) (the Act), as amended.

(b) Postings. (1) The Contractor agrees to post employment notices stating--

(i) The Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified individuals with disabilities; and

(ii) The rights of applicants and employees.

(2) These notices shall be posted in conspicuous places that are available to employees and applicants for employment. The Contractor shall ensure that applicants and employees with disabilities are informed of the contents of the notice (e.g., the Contractor may have the notice read to a visually disabled individual, or may lower the posted notice so that it might be read by a person in a wheelchair). The notices shall be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance of the U.S. Department of Labor (Deputy Assistant Secretary) and shall be provided by or through the Contracting Officer.

(3) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of Section 503 of the Act and is committed to take affirmative action to employ, and advance in employment, qualified individuals with physical or mental disabilities.

(c) Noncompliance. If the Contractor does not comply with the requirements of this clause, appropriate actions may be taken under the rules, regulations, and relevant orders of the Secretary issued pursuant to the Act.

(d) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order in excess of \$10,000 unless exempted by rules, regulations, or orders of the Secretary. The Contractor shall act as specified by the Deputy Assistant Secretary to enforce the terms, including action for noncompliance.

(End of clause)

#### 52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) Unless the Contractor is a State or local government agency, the Contractor shall report at least annually, as required by the Secretary of Labor, on--

(1) The number of special disabled veterans, the number of veterans of the Vietnam era, and other eligible veterans in the workforce of the Contractor by job category and hiring location; and

(2) The total number of new employees hired during the period covered by the report, and of the total, the number of special disabled veterans, the number of veterans of the Vietnam era, and the number of other eligible veterans; and

(3) The maximum number and the minimum number of employees of the Contractor during the period covered by the report.

(b) The Contractor shall report the above items by completing the Form VETS-100, entitled "Federal Contractor Veterans" Employment Report (VETS-100 Report)".

(c) The Contractor shall submit VETS-100 Reports no later than September 30 of each year beginning September 30, 1988.

(d) The employment activity report required by paragraph (a)(2) of this clause shall reflect total hires during the most recent 12-month period as of the ending date selected for the employment profile report required by paragraph (a)(1) of this clause. Contractors may select an ending date--

(1) As of the end of any pay period between July 1 and August 31 of the year the report is due; or

(2) As of December 31, if the Contractor has prior written approval from the Equal Employment Opportunity Commission to do so for purposes of submitting the Employer Information Report EEO-1 (Standard Form 100).

(e) The Contractor shall base the count of veterans reported according to paragraph (a) of this clause on voluntary disclosure. Each Contractor subject to the reporting requirements at 38 U.S.C. 4212 shall invite all special disabled veterans, veterans of the Vietnam era, and other eligible veterans who wish to benefit under the affirmative action program at 38 U.S.C. 4212 to identify themselves to the Contractor. The invitation shall state that--

- (1) The information is voluntarily provided;
- (2) The information will be kept confidential;
- (3) Disclosure or refusal to provide the information will not subject the applicant or employee to any adverse treatment; and
- (4) The information will be used only in accordance with the regulations promulgated under 38 U.S.C. 4212.
- (f) The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of \$25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor.

(End of clause)

#### 52.223-3 HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997)

- (a) "Hazardous material", as used in this clause, includes any material defined as hazardous under the latest version of Federal Standard No. 313 (including revisions adopted during the term of the contract).
- (b) The offeror must list any hazardous material, as defined in paragraph (a) of this clause, to be delivered under this contract. The hazardous material shall be properly identified and include any applicable identification number, such as National Stock Number or Special Item Number. This information shall also be included on the Material Safety Data Sheet submitted under this contract.

Material	Identification No.
(If none, insert "None")	
_____	_____
_____	_____
_____	_____

(c) This list must be updated during performance of the contract whenever the Contractor determines that any other material to be delivered under this contract is hazardous.

(d) The apparently successful offeror agrees to submit, for each item as required prior to award, a Material Safety Data Sheet, meeting the requirements of 29 CFR 1910.1200(g) and the latest version of Federal Standard No. 313, for all hazardous material identified in paragraph (b) of this clause. Data shall be submitted in accordance with Federal Standard No. 313, whether or not the apparently successful offeror is the actual manufacturer of these items. Failure to submit the Material Safety Data Sheet prior to award may result in the apparently successful offeror being considered nonresponsible and ineligible for award.

(e) If, after award, there is a change in the composition of the item(s) or a revision to Federal Standard No. 313, which renders incomplete or inaccurate the data submitted under paragraph (d) of this clause, the Contractor shall promptly notify the Contracting Officer and resubmit the data.

(f) Neither the requirements of this clause nor any act or failure to act by the Government shall relieve the Contractor of any responsibility or liability for the safety of Government, Contractor, or subcontractor personnel or property.

(g) Nothing contained in this clause shall relieve the Contractor from complying with applicable Federal, State, and local laws, codes, ordinances, and regulations (including the obtaining of licenses and permits) in connection with

hazardous material.

(h) The Government's rights in data furnished under this contract with respect to hazardous material are as follows:

(1) To use, duplicate and disclose any data to which this clause is applicable. The purposes of this right are to--

(i) Apprise personnel of the hazards to which they may be exposed in using, handling, packaging, transporting, or disposing of hazardous materials;

(ii) Obtain medical treatment for those affected by the material; and

(iii) Have others use, duplicate, and disclose the data for the Government for these purposes.

(2) To use, duplicate, and disclose data furnished under this clause, in accordance with subparagraph (h)(1) of this clause, in precedence over any other clause of this contract providing for rights in data.

(3) The Government is not precluded from using similar or identical data acquired from other sources.

(End of clause)

#### 52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (APR 1998)

(a) Executive Order 12856 of August 3, 1993, requires Federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA)(42 U.S.C. 11001-11050) and the Pollution Prevention Act of 1990 (PPA)(42 U.S.C. 13101-13109).

(b) The Contractor shall provide all information needed by the Federal facility to comply with the emergency planning reporting requirements of Section 302 of EPCRA; the emergency notice requirements of Section 304 of EPCRA; the list of Material Safety Data Sheets required by Section 311 of EPCRA; the emergency and hazardous chemical inventory forms of Section 312 of EPCRA; the toxic chemical release inventory of Section 313 of EPCRA, which includes the reduction and recycling information required by Section 6607 of PPA; and the toxic chemical reduction goals requirements of Section 3-302 of Executive Order 12856.

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#### 52.223-6 DRUG-FREE WORKPLACE (MAY 2001)

(a) Definitions. As used in this clause --

"Controlled substance" means a controlled substance in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11 - 1308.15.

"Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.

"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession, or use of any controlled substance.

"Drug-free workplace" means the site(s) for the performance of work done by the Contractor in connection with a specific contract where employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other Contractor employee who has other than a minimal impact or involvement in contract performance.

"Individual" means an offeror/contractor that has no more than one employee including the offeror/contractor.

(b) The Contractor, if other than an individual, shall-- within 30 days after award (unless a longer period is agreed to in writing for contracts of 30 days or more performance duration), or as soon as possible for contracts of less than 30 days performance duration--

(1) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;

(2) Establish an ongoing drug-free awareness program to inform such employees about--

(i) The dangers of drug abuse in the workplace;

(ii) The Contractor's policy of maintaining a drug-free workplace;

(iii) Any available drug counseling, rehabilitation, and employee assistance programs; and

(iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this clause;

(4) Notify such employees in writing in the statement required by subparagraph (b)(1) of this clause that, as a condition of continued employment on this contract, the employee will--

(i) Abide by the terms of the statement; and

(ii) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 5 days after such conviction.

(5) Notify the Contracting Officer in writing within 10 days after receiving notice under subdivision (b)(4)(ii) of this clause, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee;

(6) Within 30 days after receiving notice under subdivision (b)(4)(ii) of this clause of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace:

(i) Taking appropriate personnel action against such employee, up to and including termination; or

(ii) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency; and

(7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (b)(1) through (b)(6) of this clause.

(c) The Contractor, if an individual, agrees by award of the contract or acceptance of a purchase order, not to engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance while performing this contract.

(d) In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraph (b) or (c) of this clause may, pursuant to FAR 23.506, render the Contractor subject to suspension of contract payments, termination of the contract for default, and suspension or debarment.

(End of clause)

#### 52.223-14 TOXIC CHEMICAL RELEASE REPORTING (OCT 2000)

(a) Unless otherwise exempt, the Contractor, as owner or operator of a facility used in the performance of this contract, shall file by July 1 for the prior calendar year an annual Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023(a) and (g)), and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106). The Contractor shall file, for each facility subject to the Form R filing and reporting requirements, the annual Form R throughout the life of the contract.

(b) A Contractor owned or operated facility used in the performance of this contract is exempt from the requirement to file an annual Form R if--

(1) The facility does not manufacture, process, or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

(2) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

(3) The facility does not meet the reporting thresholds of toxic chemicals established under of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

(4) The facility does not fall within Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

(5) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

(c) If the Contractor has certified to an exemption in accordance with one or more of the criteria in paragraph (b) of this clause, and after award of the contract circumstances change so that any of its owned or operated facilities used in the performance of this contract is no longer exempt--

(1) The Contractor shall notify the Contracting Officer; and

(2) The Contractor, as owner or operator of a facility used in the performance of this contract that is no longer exempt, shall (i) submit a Toxic Chemical Release Inventory Form (Form R) on or before July 1 for the prior calendar year during which the facility becomes eligible; and (ii) continue to file the annual Form R for the life of the contract for such facility.

(d) The Contracting Officer may terminate this contract or take other action as appropriate, if the Contractor fails to comply accurately and fully with the EPCRA and PPA toxic chemical release filing and reporting requirements.

(e) Except for acquisitions of commercial items, as defined in FAR Part 2, the Contractor shall--

(1) For competitive subcontracts expected to exceed \$100,000 (including all options), include a solicitation provision substantially the same as the provision at FAR 52.223-13, Certification of Toxic Chemical Release Reporting; and

(2) Include in any resultant subcontract exceeding \$100,000 (including all options), the substance of this clause, except this paragraph (e).

## 52.225-5 TRADE AGREEMENTS (DEC 2001)

(a) Definitions. As used in this clause.

Caribbean Basin country means any of the following countries: Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, British Virgin Islands, Costa Rica, Dominica, El Salvador, Grenada, Guatemala, Guyana, Haiti, Iceland, Jamaica, Montserrat, Netherlands Antilles, Nicaragua, Panama, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago.

Caribbean Basin country end product means an article that--

(1) Is wholly the growth, product, or manufacture of a Caribbean Basin country; or

(2) In the case of an article that consists in whole or in part of materials from another country, has been substantially transformed in a Caribbean Basin country into a new and different article of commerce with a name, character, or use distinct from that of the article or articles from which it was transformed. The term refers to a product offered for purchase under a supply contract, but for purposes of calculating the value of the end product includes services (except transportation services) incidental to the article, provided that the value of those incidental services does not exceed that of the article itself. The term excludes products that are excluded from duty-free treatment for Caribbean countries under 19 U.S.C. 2703(b), which presently are--

(i) Textiles and apparel articles that are subject to textile agreements;

(ii) Footwear, handbags, luggage, flat goods, work gloves, and leather wearing apparel not designated as eligible articles for the purpose of the Generalized System of Preferences under Title V of the Trade Act of 1974;

(iii) Tuna, prepared or preserved in any manner in airtight containers;

(iv) Petroleum, or any product derived from petroleum; and

(v) Watches and watch parts (including cases, bracelets, and straps) of whatever type including, but not limited to, mechanical, quartz digital, or quartz analog, if such watches or watch parts contain any material that is the product of any country to which the Harmonized Tariff Schedule of the United States (HTSUS) column 2 rates of duty apply.

Designated country means any of the following countries: Aruba, Austria, Bangladesh, Belgium, Benin, Bhutan, Botswana, Burkina Faso, Burundi, Canada, Cape Verde, Central African Republic, Chad, Comoros, Denmark, Djibouti, Equatorial Guinea.

Finland, France, Gambia, Germany, Greece, Guinea, Guinea-Bissau, Haiti, Hong Kong, Ireland, Israel, Italy, Japan.

Kiribati, Korea, Republic of Lesotho, Liechtenstein, Luxembourg, Malawi, Maldives, Mali, Mozambique, Nepal, Netherlands, Niger, Norway, Portugal, Rwanda.

Sao Tome and Principe, Sierra Leone, Singapore, Somalia, Spain, Sweden, Switzerland, Tanzania U.R., Togo, Tuvalu, Uganda, United Kingdom, Vanuatu, Western Samoa, Yemen.

Designated country end product means an article that--

(1) Is wholly the growth, product, or manufacture of a designated country; or

(2) In the case of an article that consists in whole or in part of materials from another country, has been substantially transformed in a designated country into a new and different article of commerce with a name, character, or use distinct from that of the article or articles from which it was transformed. The term refers to a product offered for

purchase under a supply contract, but for purposes of calculating the value of the end product includes services, (except transportation services) incidental to the article, provided that the value of those incidental services does not exceed that of the article itself.

End product means supplies delivered under a line item of a Government contract.

North American Free Trade Agreement country means Canada or Mexico.

North American Free Trade Agreement country end product means an article that--

(1) Is wholly the growth, product, or manufacture of a North American Free Trade Agreement (NAFTA) country; or

(2) In the case of an article that consists in whole or in part of materials from another country, has been substantially transformed in a NAFTA country into a new and different article of commerce with a name, character, or use distinct from that of the article or articles from which it was transformed. The term refers to a product offered for purchase under a supply contract, but for purposes of calculating the value of the end product includes services, (except transportation services) incidental to the article, provided that the value of those incidental services does not exceed that of the article itself.

United States means the 50 States and the District of Columbia, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

U.S.-made end product means an article that is mined, produced, or manufactured in the United States or that is substantially transformed in the United States into a new and different article of commerce with a name, character, or use distinct from that of the article or articles from which it was transformed.,

(b) Implementation. This clause implements the Trade, Agreements Act (19 U.S.C. 2501, et seq.) and the North American Free Trade Agreement Implementation Act of 1993, (NAFTA) (19 U.S.C. 3301 note), by restricting the acquisition of end products that are not U.S.-made, designated country, Caribbean Basin country, or NAFTA country end products.,

(c) Delivery of end products. The Contracting Officer has determined that the Trade Agreements Act and NAFTA apply to this acquisition. Unless otherwise specified, these trade agreements apply to all items in the Schedule. The Contractor shall deliver under this contract only U.S.-made, designated country, Caribbean Basin country, or NAFTA country end products except to the extent that, in its offer, it specified delivery of other end products in the provision entitled "Trade Agreements Certificate."

(End of clause)

## 52.225-9 BUY AMERICAN ACT--BALANCE OF PAYMENTS PROGRAM--CONSTRUCTION MATERIALS (FEB 2000)

(a) Definitions. As used in this clause--

Component means any article, material, or supply incorporated directly into construction materials.

Construction material means an article, material, or supply brought to the construction site by the Contractor or a subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

Cost of components means--

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the end product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

Domestic construction material means--

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

Foreign construction material means a construction material other than a domestic construction material.

United States means the 50 States and the District of Columbia, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(b) Domestic preference. (1) This clause implements the Buy American Act (41 U.S.C. 10a-10d) and the Balance of Payments Program by providing a preference for domestic construction material. The Contractor shall use only domestic construction material in performing this contract, except as provided in paragraphs (b)(2) and (b)(3) of this clause.

(2) This requirement does not apply to the construction material or components listed by the Government as follows:  
NONE

(3) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(2) of this clause if the Government determines that

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the requirements of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent. For determination of unreasonable cost under the Balance of Payments Program, the Contracting Officer will use a factor of 50 percent;

(ii) The application of the restriction of the Buy American Act or Balance of Payments Program to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) Request for determination of inapplicability of the Buy American Act or Balance of Payments Program. (1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(3) of this clause shall include adequate information for Government evaluation of the request, including--

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

- (D) Price;
- (E) Time of delivery or availability;
- (F) Location of the construction project;
- (G) Name and address of the proposed supplier; and
- (H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.
- (ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.
- (iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).
- (iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.
- (2) If the Government determines after contract award that an exception to the Buy American Act or Balance of Payments Program applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(3)(i) of this clause.
- (3) Unless the Government determines that an exception to the Buy American Act or Balance of Payments Program applies, use of foreign construction material is noncompliant with the Buy American Act or Balance of Payments Program.
- (d) Data. To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

Foreign and Domestic Construction Materials Price Comparison

Construction material description	Unit of measure	Quantity	Price (dollars) \1\
Item 1			
Foreign construction material....	.....	.....	.....
Domestic construction material...	.....	.....	.....
Item 2			
Foreign construction material....	.....	.....	.....
Domestic construction material...	.....	.....	.....

Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).

List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.

Include other applicable supporting information.

(End of clause)

**52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JUL 2000)**

(a) The Contractor shall not acquire, for use in the performance of this contract, any supplies or services originating from sources within, or that were located in or transported from or through, countries whose products are banned from importation into the United States under regulations of the Office of Foreign Assets Control, Department of the Treasury. Those countries are Cuba, Iran, Iraq, Libya, North Korea, Sudan, the territory of Afghanistan controlled by the Taliban, and Serbia (excluding the territory of Kosovo).

(b) The Contractor shall not acquire for use in the performance of this contract any supplies or services from entities controlled by the government of Iraq.

(c) The Contractor shall insert this clause, including this paragraph (c), in all subcontracts.

(End of clause)

**52.226-1 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES (JUN 2000)**

(a) Definitions. As used in this clause:

"Indian" means any person who is a member of any Indian tribe, band, group, pueblo or community that is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs (BIA) in accordance with 25 U.S.C. 1452(c) and any "Native" as defined in the Alaska Native Claims Settlement Act (43 U.S.C. 1601).

"Indian organization" means the governing body of any Indian tribe or entity established or recognized by the governing body of an Indian tribe for the purposes of 25 U.S.C., chapter 17.

"Indian-owned economic enterprise" means any Indian-owned (as determined by the Secretary of the Interior) commercial, industrial, or business activity established or organized for the purpose of profit, provided that Indian ownership constitute a not less than 51 percent of the enterprise.

"Indian tribe" means any Indian tribe, band, group, pueblo or community, including native villages and native groups (including corporations organized by Kenai, Juneau, Sitka, and Kodiak) as defined in the Alaska Native Claims Settlement Act, that is recognized by the Federal Government as eligible for services from BIA in accordance with 25 U.S.C. 1542(c).

"Interested party" means a prime contractor or an actual or prospective offeror whose direct economic interest would be affected by the award of a subcontract or by the failure to award a subcontract.

(b) The Contractor shall use its best efforts to give Indian organizations and Indian-owned economic enterprises (25 U.S.C. 1544) the maximum practicable opportunity to participate in the subcontracts it awards to the fullest extent consistent with efficient performance of its contract.

(1) The Contracting Officer and the Contractor, acting in good faith, may rely on the representation of an Indian organization or Indian-owned economic enterprise as to its eligibility, unless an interested party challenges its status or the Contracting Officer has independent reason to question that status. In the event of a challenge to the representation of a subcontractor, the Contracting Officer will refer the matter to the U.S. Department of the Interior, Bureau of Indian Affairs (BIA), Attn: Chief, Division of Contracting and Grants Administration, 1849 C Street, NW., MS 2626-MIB, Washington, DC 20240-4000.

The BIA will determine the eligibility and notify the Contracting Officer. No incentive payment will be made within 50 working days of subcontract award or while a challenge is pending. If a subcontractor is determined to be an ineligible participant, no incentive payment will be made under the Indian Incentive Program.

(2) The Contractor may request an adjustment under the Indian Incentive Program to the following:

- (i) The estimated cost of a cost-type contract.
- (ii) The target cost of a cost-plus-incentive-fee prime contract.
- (iii) The target cost and ceiling price of a fixed-price incentive prime contract.
- (iv) The price of a firm-fixed-price prime contract.

(3) The amount of the adjustment to the prime contract is 5 percent of the estimated cost, target cost, or firm-fixed-price included in the subcontract initially awarded to the Indian organization or Indian-owned economic enterprise.

(4) The Contractor has the burden of proving the amount claimed and must assert its request for an adjustment prior to completion of contract performance.

(c) The Contracting Officer, subject to the terms and conditions of the contract and the availability of funds, will authorize an incentive payment of 5 percent of the amount paid to the subcontractor. The Contracting Officer will seek funding in accordance with agency procedures.

(End of clause)

#### 52.227-1 AUTHORIZATION AND CONSENT (JUL 1995)

(a) The Government authorizes and consents to all use and manufacture, in performing this contract or any subcontract at any tier, of any invention described in and covered by a United States patent (1) embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract or (2) used in machinery, tools, or methods whose use necessarily results from compliance by the Contractor or a subcontractor with (i) specifications or written provisions forming a part of this contract or (ii) specific written instructions given by the Contracting Officer directing the manner of performance. The entire liability to the Government for infringement of a patent of the United States shall be determined solely by the provisions of the indemnity clause, if any, included in this contract or any subcontract hereunder (including any lower-tier subcontract), and the Government assumes liability for all other infringement to the extent of the authorization and consent hereinabove granted.

(b) The Contractor agrees to include, and require inclusion of, this clause, suitably modified to identify the parties, in all subcontracts at any tier for supplies or services (including construction, architect-engineer services, and materials, supplies, models, samples, and design or testing services expected to exceed the simplified acquisition threshold (however, omission of this clause from any subcontract, including those at or below the simplified acquisition threshold, does not affect this authorization and consent.)

#### 52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)

The Contractor shall promptly furnish additional security required to protect the Government and persons supplying labor or materials under this contract if--

(a) Any surety upon any bond, or issuing financial institution for other security, furnished with this contract becomes

unacceptable to the Government.

- (b) Any surety fails to furnish reports on its financial condition as required by the Government;
- (c) The contract price is increased so that the penal sum of any bond becomes inadequate in the opinion of the Contracting Officer; or
- (d) An irrevocable letter of credit (ILC) used as security will expire before the end of the period of required security. If the Contractor does not furnish an acceptable extension or replacement ILC, or other acceptable substitute, at least 30 days before an ILC's scheduled expiration, the Contracting officer has the right to immediately draw on the ILC.

#### 52.228-11 PLEDGES OF ASSETS (FEB 1992)

(a) Offerors shall obtain from each person acting as an individual surety on a bid guarantee, a performance bond, or a payment bond--

(1) Pledge of assets; and

(2) Standard Form 28, Affidavit of Individual Surety.

(b) Pledges of assets from each person acting as an individual surety shall be in the form of--

(1) Evidence of an escrow account containing cash, certificates of deposit, commercial or Government securities, or other assets described in FAR 28.203-2 (except see 28.203-2(b)(2) with respect to Government securities held in book entry form) and/or;

(2) A recorded lien on real estate. The offeror will be required to provide--

(i) Evidence of title in the form of a certificate of title prepared by a title insurance company approved by the United States Department of Justice. This title evidence must show fee simple title vested in the surety along with any concurrent owners; whether any real estate taxes are due and payable; and any recorded encumbrances against the property, including the lien filed in favor of the Government as required by FAR 28.203-3(d);

(ii) Evidence of the amount due under any encumbrance shown in the evidence of title;

(iii) A copy of the current real estate tax assessment of the property or a current appraisal dated no earlier than 6 months prior to the date of the bond, prepared by a professional appraiser who certifies that the appraisal has been conducted in accordance with the generally accepted appraisal standards as reflected in the Uniform Standards of Professional Appraisal Practice, as promulgated by the Appraisal Foundation.

(End of clause)

#### 52.228-12 PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS. (OCT 1995)

In accordance with Section 806(a)(3) of Pub. L. 102-190, as amended by Sections 2091 and 8105 of Pub. L. 103-355, upon the request of a prospective subcontractor or supplier offering to furnish labor or material for the performance of this contract for which a payment bond has been furnished to the Government pursuant to the Miller Act, the Contractor shall promptly provide a copy of such payment bond to the requester.

#### 52.228-14 IRREVOCABLE LETTER OF CREDIT (DEC 1999)

(a) "Irrevocable letter of credit" (ILC), as used in this clause, means a written commitment by a federally insured

financial institution to pay all or part of a stated amount of money, until the expiration date of the letter, upon presentation by the Government (the beneficiary) of a written demand therefor. Neither the financial institution nor the offeror/Contractor can revoke or condition the letter of credit.

(b) If the offeror intends to use an ILC in lieu of a bid bond, or to secure other types of bonds such as performance and payment bonds, the letter of credit and letter of confirmation formats in paragraphs (e) and (f) of this clause shall be used.

(c) The letter of credit shall be irrevocable, shall require presentation of no document other than a written demand and the ILC (including confirming letter, if any), shall be issued/confirmed by an acceptable federally insured financial institution as provided in paragraph (d) of this clause, and--

(1) If used as a bid guarantee, the ILC shall expire no earlier than 60 days after the close of the bid acceptance period;

(2) If used as an alternative to corporate or individual sureties as security for a performance or payment bond, the offeror/Contractor may submit an ILC with an initial expiration date estimated to cover the entire period for which financial security is required or may submit an ILC with an initial expiration date that is a minimum period of one year from the date of issuance. The ILC shall provide that, unless the issuer provides the beneficiary written notice of non-renewal at least 60 days in advance of the current expiration date, the ILC is automatically extended without amendment for one year from the expiration date, or any future expiration date, until the period of required coverage is completed and the Contracting Officer provides the financial institution with a written statement waiving the right to payment. The period of required coverage shall be:

(i) For contracts subject to the Miller Act, the later of--

(A) One year following the expected date of final payment;

(B) For performance bonds only, until completion of any warranty period; or

(C) For payment bonds only, until resolution of all claims filed against the payment bond during the one-year period following final payment.

(ii) For contracts not subject to the Miller Act, the later of--

(A) 90 days following final payment; or

(B) For performance bonds only, until completion of any warranty period.

(d) Only federally insured financial institutions rated investment grade or higher shall issue or confirm the ILC. The offeror/Contractor shall provide the Contracting Officer a credit rating that indicates the financial institution has the required rating(s) as of the date of issuance of the ILC. Unless the financial institution issuing the ILC had letter of credit business of less than \$25 million in the past year, ILCs over \$5 million must be confirmed by another acceptable financial institution that had letter of credit business of less than \$25 million in the past year.

(e) The following format shall be used by the issuing financial institution to create an ILC:

\_\_\_\_\_

[Issuing Financial Institution's Letterhead or Name and Address]

Issue Date \_\_\_\_\_

IRREVOCABLE LETTER OF CREDIT NO. \_\_\_\_\_

Account party's name \_\_\_\_\_

Account party's address \_\_\_\_\_

For Solicitation No. \_\_\_\_\_ (for reference only)

TO: [U.S. Government agency]

[U.S. Government agency's address]

1. We hereby establish this irrevocable and transferable Letter of Credit in your favor for one or more drawings up to United States \$\_\_\_\_\_. This Letter of Credit is payable at [issuing financial institution's and, if any, confirming financial institution's] office at [issuing financial institution's address and, if any, confirming financial institution's address] and expires with our close of business on \_\_\_\_\_, or any automatically extended expiration date.

2. We hereby undertake to honor your or the transferee's sight draft(s) drawn on the issuing or, if any, the confirming financial institution, for all or any part of this credit if presented with this Letter of Credit and confirmation, if any, at the office specified in paragraph 1 of this Letter of Credit on or before the expiration date or any automatically extended expiration date.

3. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this Letter of Credit that it is deemed to be automatically extended without amendment for one year from the expiration date hereof, or any future expiration date, unless at least 60 days prior to any expiration date, we notify you or the transferee by registered mail, or other receipted means of delivery, that we elect not to consider this Letter of Credit renewed for any such additional period. At the time we notify you, we also agree to notify the account party (and confirming financial institution, if any) by the same means of delivery.

4. This Letter of Credit is transferable. Transfers and assignments of proceeds are to be effected without charge to either the beneficiary or the transferee/assignee of proceeds. Such transfer or assignment shall be only at the written direction of the Government (the beneficiary) in a form satisfactory to the issuing financial institution and the confirming financial institution, if any.

5. This Letter of Credit is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of \_\_\_\_\_ [state of confirming financial institution, if any, otherwise state of issuing financial institution].

6. If this credit expires during an interruption of business of this financial institution as described in Article 17 of the UCP, the financial institution specifically agrees to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

\_\_\_\_\_

[Issuing financial institution]

(f) The following format shall be used by the financial institution to confirm an ILC:

\_\_\_\_\_  
[Confirming Financial Institution's Letterhead or Name and Address]

(Date) \_\_\_\_\_

Our Letter of Credit Advice Number \_\_\_\_\_

Beneficiary: \_\_\_\_\_ [U.S. Government agency]

Issuing Financial Institution: \_\_\_\_\_

Issuing Financial Institution's LC No.: \_\_\_\_\_

Gentlemen:

1. We hereby confirm the above indicated Letter of Credit, the original of which is attached, issued by \_\_\_\_\_ [name of issuing financial institution] for drawings of up to United States dollars \_\_\_\_\_/U.S. \$\_\_\_\_\_ and expiring with our close of business on \_\_\_\_\_ [the expiration date], or any automatically extended expiration date.

2. Draft(s) drawn under the Letter of Credit and this Confirmation are payable at our office located at \_\_\_\_\_.

3. We hereby undertake to honor sight draft(s) drawn under and presented with the Letter of Credit and this Confirmation at our offices as specified herein.

4. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this confirmation that it be deemed automatically extended without amendment for one year from the expiration date hereof, or any automatically extended expiration date, unless:

(a) At least 60 days prior to any such expiration date, we shall notify the Contracting Officer, or the transferee and the issuing financial institution, by registered mail or other receipted means of delivery, that we elect not to consider this confirmation extended for any such additional period; or

(b) The issuing financial institution shall have exercised its right to notify you or the transferee, the account party, and ourselves, of its election not to extend the expiration date of the Letter of Credit.

5. This confirmation is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of \_\_\_\_\_ [state of confirming financial institution].

6. If this confirmation expires during an interruption of business of this financial institution as described in Article 17 of the UCP, we specifically agree to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

\_\_\_\_\_

[Confirming financial institution]

(g) The following format shall be used by the Contracting Officer for a sight draft to draw on the Letter of Credit:

**SIGHT DRAFT**

\_\_\_\_\_

[City, State]

(Date) \_\_\_\_\_

[Name and address of financial institution]

Pay to the order of \_\_\_\_\_ [Beneficiary Agency] \_\_\_\_\_ the sum of United States \$ \_\_\_\_\_.  
This draft is drawn under Irrevocable Letter of Credit No. \_\_\_\_\_.

\_\_\_\_\_

[Beneficiary Agency]

By: \_\_\_\_\_

(End of clause)

#### 52.228-15 PERFORMANCE AND PAYMENT BONDS--CONSTRUCTION (JUL 2000)-

(a) Definitions. As used in this clause--

Original contract price means the award price of the contract; or, for requirements contracts, the price payable for the estimated total quantity; or, for indefinite-quantity contracts, the price payable for the specified minimum quantity. Original contract price does not include the price of any options, except those options exercised at the time of contract award.

(b) Amount of required bonds. Unless the resulting contract price is \$100,000 or less, the successful offeror shall furnish performance and payment bonds to the Contracting Officer as follows:

(1) Performance bonds (Standard Form 25). The penal amount of performance bonds at the time of contract award shall be 100 percent of the original contract price.

(2) Payment Bonds (Standard Form 25-A). The penal amount of payment bonds at the time of contract award shall be 100 percent of the original contract price.

(3) Additional bond protection. (i) The Government may require additional performance and payment bond protection if the contract price is increased. The increase in protection generally will equal 100 percent of the increase in contract price.

(ii) The Government may secure the additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) Furnishing executed bonds. The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Contracting Officer, within the time period specified in the Bid Guarantee provision of the solicitation, or otherwise specified by the Contracting Officer, but in any event, before starting work.

(d) Surety or other security for bonds. The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the Federal Register or may be obtained from the U.S. Department of Treasury, Financial Management Service, Surety Bond Branch, 401 14th Street, NW, 2nd Floor, West Wing, Washington, DC 20227.

(e) Notice of subcontractor waiver of protection (40 U.S.C. 270b(c)). Any waiver of the right to sue on the payment bond is void unless it is in writing, signed by the person whose right is waived, and executed after such person has first furnished labor or material for use in the performance of the contract.

(End of clause)

## 52.229-3 FEDERAL, STATE, AND LOCAL TAXES (JAN 1991)

(a) "Contract date," as used in this clause, means the date set for bid opening or, if this is a negotiated contract or a modification, the effective date of this contract or modification.

"All applicable Federal, State, and local taxes and duties," as used in this clause, means all taxes and duties, in effect on the contract date, that the taxing authority is imposing and collecting on the transactions or property covered by this contract.

"After-imposed Federal tax," as used in this clause, means any new or increased Federal excise tax or duty, or tax that was exempted or excluded on the contract date but whose exemption was later revoked or reduced during the contract period, on the transactions or property covered by this contract that the Contractor is required to pay or bear as the result of legislative, judicial, or administrative action taking effect after the contract date. It does not include social security tax or other employment taxes.

"After-relieved Federal tax," as used in this clause, means any amount of Federal excise tax or duty, except social security or other employment taxes, that would otherwise have been payable on the transactions or property covered by this contract, but which the Contractor is not required to pay or bear, or for which the Contractor obtains a refund or drawback, as the result of legislative, judicial, or administrative action taking effect after the contract date.

(b) The contract price includes all applicable Federal, State, and local taxes and duties.

(c) The contract price shall be increased by the amount of any after-imposed Federal tax, provided the Contractor warrants in writing that no amount for such newly imposed Federal excise tax or duty or rate increase was included in the contract price, as a contingency reserve or otherwise.

(d) The contract price shall be decreased by the amount of any after-relieved Federal tax.

(e) The contract price shall be decreased by the amount of any Federal excise tax or duty, except social security or other employment taxes, that the Contractor is required to pay or bear, or does not obtain a refund of, through the Contractor's fault, negligence, or failure to follow instructions of the Contracting Officer.

(f) No adjustment shall be made in the contract price under this clause unless the amount of the adjustment exceeds \$250.

(g) The Contractor shall promptly notify the Contracting Officer of all matters relating to any Federal excise tax or duty that reasonably may be expected to result in either an increase or decrease in the contract price and shall take appropriate action as the Contracting Officer directs.

(h) The Government shall, without liability, furnish evidence appropriate to establish exemption from any Federal, State, or local tax when the Contractor requests such evidence and a reasonable basis exists to sustain the exemption.

(End of clause)

## 52.230-3 DISCLOSURE AND CONSISTENCY OF COST ACCOUNTING PRACTICES (APR 1998)

(a) The Contractor, in connection with this contract, shall--

(1) Comply with the requirements of 48 CFR 9904.401, Consistency in Estimating, Accumulating, and Reporting Costs; 48 CFR 9904.402, Consistency in Allocating Costs Incurred for the Same Purpose; 48 CFR 9904.405, Accounting for Unallowable Costs; and 48 CFR 9904.406, Cost Accounting Standard--Cost Accounting Period, in effect on the date of award of this contract as indicated in 48 CFR Part 9904.

(2) (CAS-covered Contracts Only) If it is a business unit of a company required to submit a Disclosure Statement, disclose in writing its cost accounting practices as required by 48 CFR 9903.202-1 through 9903.202-5. If the

Contractor has notified the Contracting Officer that the Disclosure Statement contains trade secrets and commercial or financial information which is privileged and confidential, the Disclosure Statement shall be protected and shall not be released outside of the Government.

(3)(i) Follow consistently the Contractor's cost accounting practices. A change to such practices may be proposed, however, by either the Government or the Contractor, and the Contractor agrees to negotiate with the Contracting Officer the terms and conditions under which a change may be made. After the terms and conditions under which the change is to be made have been agreed to, the change must be applied prospectively to this contract, and the Disclosure Statement, if affected, must be amended accordingly.

(ii) The Contractor shall, when the parties agree to a change to a cost accounting practice and the Contracting Officer has made the finding required in 48 CFR 9903.201-6(b), that the change is desirable and not detrimental to the interests of the Government, negotiate an equitable adjustment as provided in the Changes clause of this contract. In the absence of the required finding, no agreement may be made under this contract clause that will increase costs paid by the United States.

(4) Agree to an adjustment of the contract price or cost allowance, as appropriate, if the Contractor or a subcontractor fails to comply with the applicable CAS or to follow any cost accounting practice, and such failure results in any increased costs paid by the United States. Such adjustment shall provide for recovery of the increased costs to the United States together with interest thereon computed at the annual rate of interest established under the Internal Revenue Code of 1986 (26 U.S.C. 6621), from the time the payment by the United States was made to the time the adjustment is effected.

(b) If the parties fail to agree whether the Contractor has complied with an applicable CAS, rule, or regulation as specified in 48 CFR 9903 and 9904 and as to any cost adjustment demanded by the United States, such failure to agree will constitute a dispute under the Contract Disputes Act (41 U.S.C. 601).

(c) The Contractor shall permit any authorized representatives of the Government to examine and make copies of any documents, papers, and records relating to compliance with the requirements of this clause.

(d) The Contractor shall include in all negotiated subcontracts, which the Contractor enters into, the substance of this clause, except paragraph (b), and shall require such inclusion in all other subcontracts of any tier, except that--

(1) If the subcontract is awarded to a business unit which pursuant to 48 CFR 9903.201-2 is subject to other types of CAS coverage, the substance of the applicable clause set forth in subsection 30.201-4 of the Federal Acquisition Regulation shall be inserted.

(2) This requirement shall apply only to negotiated subcontracts in excess of \$500,000.

(3) The requirement shall not apply to negotiated subcontracts otherwise exempt from the requirement to include a CAS clause as specified in 48 CFR 9903.201-1.

## 52.232-5 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (MAY 1997)

(a) Payment of price. The Government shall pay the Contractor the contract price as provided in this contract.

(b) Progress payments. The Government shall make progress payments monthly as the work proceeds, or at more frequent intervals as determined by the Contracting Officer, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer.

(1) The Contractor's request for progress payments shall include the following substantiation:

(i) An itemization of the amounts requested, related to the various elements of work required by the contract covered by the payment requested.

- (ii) A listing of the amount included for work performed by each subcontractor under the contract.
  - (iii) A listing of the total amount of each subcontract under the contract.
  - (iv) A listing of the amounts previously paid to each such subcontractor under the contract.
  - (v) Additional supporting data in a form and detail required by the Contracting Officer.
- (2) In the preparation of estimates, the Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration. Material delivered to the Contractor at locations other than the site also may be taken into consideration if--
- (i) Consideration is specifically authorized by this contract; and
  - (ii) The Contractor furnishes satisfactory evidence that it has acquired title to such material and that the material will be used to perform this contract.
- (c) Contractor certification. Along with each request for progress payments, the Contractor shall furnish the following certification, or payment shall not be made: (However, if the Contractor elects to delete paragraph (c)(4) from the certification, the certification is still acceptable.)

I hereby certify, to the best of my knowledge and belief, that--

- (1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;
- (2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements and the requirements of chapter 39 of Title 31, United States Code;
- (3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract; and
- (4) This certification is not to be construed as final acceptance of a subcontractor's performance.

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(Name)

---

(Title)

---

(Date)

(d) Refund of unearned amounts. If the Contractor, after making a certified request for progress payments, discovers that a portion or all of such request constitutes a payment for performance by the Contractor that fails to conform to the specifications, terms, and conditions of this contract (hereinafter referred to as the "unearned amount"), the Contractor shall--

- (1) Notify the Contracting Officer of such performance deficiency; and
- (2) Be obligated to pay the Government an amount (computed by the Contracting Officer in the manner provided in

paragraph (j) of this clause) equal to interest on the unearned amount from the 8th day after the date of receipt of the unearned amount until--

(i) The date the Contractor notifies the Contracting Officer that the performance deficiency has been corrected; or

(ii) The date the Contractor reduces the amount of any subsequent certified request for progress payments by an amount equal to the unearned amount.

(e) Retainage. If the Contracting Officer finds that satisfactory progress was achieved during any period for which a progress payment is to be made, the Contracting Officer shall authorize payment to be made in full. However, if satisfactory progress has not been made, the Contracting Officer may retain a maximum of 10 percent of the amount of the payment until satisfactory progress is achieved. When the work is substantially complete, the Contracting Officer may retain from previously withheld funds and future progress payments that amount the Contracting Officer considers adequate for protection of the Government and shall release to the Contractor all the remaining withheld funds. Also, on completion and acceptance of each separate building, public work, or other division of the contract, for which the price is stated separately in the contract, payment shall be made for the completed work without retention of a percentage.

(f) Title, liability, and reservation of rights. All material and work covered by progress payments made shall, at the time of payment, become the sole property of the Government, but this shall not be construed as--

(1) Relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or

(2) Waiving the right of the Government to require the fulfillment of all of the terms of the contract.

(g) Reimbursement for bond premiums. In making these progress payments, the Government shall, upon request, reimburse the Contractor for the amount of premiums paid for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after the Contractor has furnished evidence of full payment to the surety. The retainage provisions in paragraph (e) of this clause shall not apply to that portion of progress payments attributable to bond premiums.

(h) Final payment. The Government shall pay the amount due the Contractor under this contract after--

(1) Completion and acceptance of all work;

(2) Presentation of a properly executed voucher; and

(3) Presentation of release of all claims against the Government arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned under the Assignment of Claims Act of 1940 (31 U.S.C. 3727 and 41 U.S.C. 15).

(i) Limitation because of undefinitized work. Notwithstanding any provision of this contract, progress payments shall not exceed 80 percent on work accomplished on undefinitized contract actions. A "contract action" is any action resulting in a contract, as defined in FAR Subpart 2.1, including contract modifications for additional supplies or services, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause, or funding and other administrative changes.

(j) Interest computation on unearned amounts. In accordance with 31 U.S.C. 3903(c)(1), the amount payable under subparagraph (d)(2) of this clause shall be--

(1) Computed at the rate of average bond equivalent rates of 91-day Treasury bills auctioned at the most recent auction of such bills prior to the date the Contractor receives the unearned amount; and

(2) Deducted from the next available payment to the Contractor.

#### 52.232-16 PROGRESS PAYMENTS (MAR 2000)

The Government will make progress payments to the Contractor when requested as work progresses, but not more frequently than monthly, in amounts of \$2,500 or more approved by the Contracting Officer, under the following conditions:

(a) Computation of amounts. (1) Unless the Contractor requests a smaller amount, the Government will compute each progress payment as 80 percent of the Contractor's total costs incurred under this contract whether or not actually paid, plus financing payments to subcontractors (see paragraph (j) of this clause), less the sum of all previous progress payments made by the Government under this contract. The Contracting Officer will consider cost of money that would be allowable under FAR 31.205-10 as an incurred cost for progress payment purposes.

(2) The amount of financing and other payments for supplies and services purchased directly for the contract are limited to the amounts that have been paid by cash, check, or other forms of payment, or that will be paid to subcontractors--

(i) In accordance with the terms and conditions of a subcontract or invoice; and

(ii) Ordinarily prior to the submission of the Contractor's next payment request to the Government.

(3) The Government will exclude accrued costs of Contractor contributions under employee pension plans until actually paid unless--

(i) The Contractor's practice is to make contributions to the retirement fund quarterly or more frequently; and

(ii) The contribution does not remain unpaid 30 days after the end of the applicable quarter or shorter payment period (any contribution remaining unpaid shall be excluded from the Contractor's total costs for progress payments until paid).

(4) The Contractor shall not include the following in total costs for progress payment purposes in subparagraph

(a)(1)(i) above:

(i) Costs that are not reasonable, allocable to this contract, and consistent with sound and generally accepted accounting principles and practices.

(ii) Costs incurred by subcontractors or suppliers.

(iii) Costs ordinarily capitalized and subject to depreciation or amortization except for the properly depreciated or amortized portion of such costs.

(iv) Payments made or amounts payable to subcontractors or suppliers, except for --

(A) Completed work, including partial deliveries, to which the Contractor has acquired title; and

(B) Work under cost-reimbursement or time-and-material subcontracts to which the Contractor has acquired title.

(5) The Contractor shall not include the following in total costs for progress payment purposes in paragraph (a)(1) of this clause:

(i) the progress payments made against incomplete work (including allowable unliquidated progress payments to

subcontractors) nor

(ii) the value, for progress payment purposes, of the incomplete work. Incomplete work shall be considered to be the supplies and services required by this contract, for which delivery and invoicing by the Contractor and acceptance by the Government are incomplete.

(6) The total amount of progress payments shall not exceed 80 percent of the total contract price.

(7) If a progress payment or the unliquidated progress payments exceed the amounts permitted by subparagraphs (a)(4) or (a)(5) above, the Contractor shall repay the amount of such excess to the Government on demand.

(8) Notwithstanding any other terms of the contract, the Contractor agrees not to request progress payments in dollar amounts of less than \$2,500. The Contracting Officer may make exceptions.

(b) Liquidation. Except as provided in the Termination for Convenience of the Government clause, all progress payments shall be liquidated by deducting from any payment under this contract, other than advance or progress payments, the unliquidated progress payments, or 80 percent of the amount invoiced, whichever is less. The Contractor shall repay to the Government any amounts required by a retroactive price reduction, after computing liquidations and payments on past invoices at the reduced prices and adjusting the unliquidated progress payments accordingly. The Government reserves the right to unilaterally change from the ordinary liquidation rate to an alternate rate when deemed appropriate for proper contract financing.

(c) Reduction or suspension. The Contracting Officer may reduce or suspend progress payments, increase the rate of liquidation, or take a combination of these actions, after finding on substantial evidence any of the following conditions:

(1) The Contractor failed to comply with any material requirement of this contract (which includes paragraphs (f) and (g) below).

(2) Performance of this contract is endangered by the Contractor's (i) failure to make progress or (ii) unsatisfactory financial condition.

(3) Inventory allocated to this contract substantially exceeds reasonable requirements.

(4) The Contractor is delinquent in payment of the costs of performing this contract in the ordinary course of business.

(5) The unliquidated progress payments exceed the fair value of the work accomplished on the undelivered portion of this contract.

(6) The Contractor is realizing less profit than that reflected in the establishment of any alternate liquidation rate in paragraph (b) above, and that rate is less than the progress payment rate stated in subparagraph (a)(1) above.

(d) Title. (1) Title to the property described in this paragraph (d) shall vest in the Government. Vestiture shall be immediately upon the date of this contract, for property acquired or produced before that date. Otherwise, vestiture shall occur when the property is or should have been allocable or properly chargeable to this contract.

(2) "Property," as used in this clause, includes all of the below-described items acquired or produced by the Contractor that are or should be allocable or properly chargeable to this contract under sound and generally accepted accounting principles and practices.

(i) Parts, materials, inventories, and work in process;

(ii) Special tooling and special test equipment to which the Government is to acquire title under any other clause of this contract;

(iii) Nondurable (i.e., noncapital) tools, jigs, dies, fixtures, molds, patterns, taps, gauges, test equipment, and other similar manufacturing aids, title to which would not be obtained as special tooling under subparagraph (ii) above; and

(iv) Drawings and technical data, to the extent the Contractor or subcontractors are required to deliver them to the Government by other clauses of this contract.

(3) Although title to property is in the Government under this clause, other applicable clauses of this contract; e.g., the termination or special tooling clauses, shall determine the handling and disposition of the property.

(4) The Contractor may sell any scrap resulting from production under this contract without requesting the Contracting Officer's approval, but the proceeds shall be credited against the costs of performance.

(5) To acquire for its own use or dispose of property to which title is vested in the Government under this clause, the Contractor must obtain the Contracting Officer's advance approval of the action and the terms. The Contractor shall (i) exclude the allocable costs of the property from the costs of contract performance, and (ii) repay to the Government any amount of unliquidated progress payments allocable to the property. Repayment may be by cash or credit memorandum.

(6) When the Contractor completes all of the obligations under this contract, including liquidation of all progress payments, title shall vest in the Contractor for all property (or the proceeds thereof) not--

(i) Delivered to, and accepted by, the Government under this contract; or

(ii) Incorporated in supplies delivered to, and accepted by, the Government under this contract and to which title is vested in the Government under this clause.

(7) The terms of this contract concerning liability for Government-furnished property shall not apply to property to which the Government acquired title solely under this clause.

(e) Risk of loss. Before delivery to and acceptance by the Government, the Contractor shall bear the risk of loss for property, the title to which vests in the Government under this clause, except to the extent the Government expressly assumes the risk. The Contractor shall repay the Government an amount equal to the unliquidated progress payments that are based on costs allocable to property that is damaged, lost, stolen, or destroyed.

(f) Control of costs and property. The Contractor shall maintain an accounting system and controls adequate for the proper administration of this clause.

(g) Reports and access to records. The Contractor shall promptly furnish reports, certificates, financial statements, and other pertinent information reasonably requested by the Contracting Officer for the administration of this clause. Also, the Contractor shall give the Government reasonable opportunity to examine and verify the Contractor's books, records, and accounts.

(h) Special terms regarding default. If this contract is terminated under the Default clause, (i) the Contractor shall, on demand, repay to the Government the amount of unliquidated progress payments and (ii) title shall vest in the Contractor, on full liquidation of progress payments, for all property for which the Government elects not to require delivery under the Default clause. The Government shall be liable for no payment except as provided by the Default clause.

(i) Reservations of rights. (1) No payment or vesting of title under this clause shall (i) excuse the Contractor from performance of obligations under this contract or (ii) constitute a waiver of any of the rights or remedies of the parties under the contract.

(2) The Government's rights and remedies under this clause (i) shall not be exclusive but rather shall be in addition

to any other rights and remedies provided by law or this contract and (ii) shall not be affected by delayed, partial, or omitted exercise of any right, remedy, power, or privilege, nor shall such exercise or any single exercise preclude or impair any further exercise under this clause or the exercise of any other right, power, or privilege of the Government.

(j) Financing payments to subcontractors. The financing payments to subcontractors mentioned in paragraphs (a)(1) and (a)(2) of this clause shall be all financing payments to subcontractors or divisions, if the following conditions are met:

(1) The amounts included are limited to--

(i) The unliquidated remainder of financing payments made; plus

(ii) Any unpaid subcontractor requests for financing payments.

(2) The subcontract or interdivisional order is expected to involve a minimum of approximately 6 months between the beginning of work and the first delivery; or, if the subcontractor is a small business concern, 4 months.

(3) If the financing payments are in the form of progress payments, the terms of the subcontract or interdivisional order concerning progress payments--

(i) Are substantially similar to the terms of this clause for any subcontractor that is a large business concern, or this clause with its Alternate I for any subcontractor that is a small business concern;

(ii) Are at least as favorable to the Government as the terms of this clause;

(iii) Are not more favorable to the subcontractor or division than the terms of this clause are to the Contractor;

(iv) Are in conformance with the requirements of FAR 32.504(e); and

(v) Subordinate all subcontractor rights concerning property to which the Government has title under the subcontract to the Government's right to require delivery of the property to the Government if--

(A) The Contractor defaults; or

(B) The subcontractor becomes bankrupt or insolvent.

(4) If the financing payments are in the form of performance-based payments, the terms of the subcontract or interdivisional order concerning payments--

(i) Are substantially similar to the Performance-Based Payments clause at FAR 52.232-32 and meet the criteria for, and definition of, performance-based payments in FAR Part 32;

(ii) Are in conformance with the requirements of FAR 32.504(f); and

(iii) Subordinate all subcontractor rights concerning property to which the Government has title under the subcontract to the Government's right to require delivery of the property to the Government if--

(A) The Contractor defaults; or

(B) The subcontractor becomes bankrupt or insolvent.

(5) If the financing payments are in the form of commercial item financing payments, the terms of the subcontract or interdivisional order concerning payments--

(i) Are constructed in accordance with FAR 32.206(c) and included in a subcontract for a commercial item purchase that meets the definition and standards for acquisition of commercial items in FAR Parts 2 and 12;

(ii) Are in conformance with the requirements of FAR 32.504(g); and

(iii) Subordinate all subcontractor rights concerning property to which the Government has title under the subcontract to the Government's right to require delivery of the property to the Government if--

(A) The Contractor defaults; or

(B) The subcontractor becomes bankrupt or insolvent.

(6) If financing is in the form of progress payments, the progress payment rate in the subcontract is the customary rate used by the contracting agency, depending on whether the subcontractor is or is not a small business concern.

(7) Concerning any proceeds received by the Government for property to which title has vested in the Government under the subcontract terms, the parties agree that the proceeds shall be applied to reducing any unliquidated financing payments by the Government to the Contractor under this contract.

(8) If no unliquidated financing payments to the Contractor remain, but there are unliquidated financing payments that the Contractor has made to any subcontractor, the Contractor shall be subrogated to all the rights the Government obtained through the terms required by this clause to be in any subcontract, as if all such rights had been assigned and transferred to the Contractor.

(9) To facilitate small business participation in subcontracting under this contract, the Contractor shall provide financing payments to small business concerns, in conformity with the standards for customary contract financing payments stated in FAR 32.113. The Contractor shall not consider the need for such financing payments as a handicap or adverse factor in the award of subcontracts.

(k) Limitations on Unfinalized Contract Actions. Notwithstanding any other progress payment provisions in this contract, progress payments may not exceed 80 percent of costs incurred on work accomplished under unfinalized contract actions. A "contract action" is any action resulting in a contract, as defined in Subpart 2.1, including contract modifications for additional supplies or services, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause, or funding and other administrative changes. This limitation shall apply to the costs incurred, as computed in accordance with paragraph (a) of this clause, and shall remain in effect until the contract action is finalized. Costs incurred which are subject to this limitation shall be segregated on Contractor progress payment requests and invoices from those costs eligible for higher progress payment rates. For purposes of progress payment liquidation, as described in paragraph (b) of this clause, progress payments for unfinalized contract actions shall be liquidated at 80 percent of the amount invoiced for work performed under the unfinalized contract action as long as the contract action remains unfinalized. The amount of unliquidated progress payments for unfinalized contract actions shall not exceed 80 percent of the maximum liability of the Government under the unfinalized contract action or such lower limit specified elsewhere in the contract. Separate limits may be specified for separate actions.

#### 52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986)

(a) The Contractor, under the Assignment of Claims Act, as amended, 31 U.S.C. 3727, 41 U.S.C. 15 (hereafter referred to as "the Act"), may assign its rights to be paid amounts due or to become due as a result of the performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency. The assignee under such an assignment may thereafter further assign or reassign its right under the original assignment to any type of financing institution described in the preceding sentence.

(b) Any assignment or reassignment authorized under the Act and this clause shall cover all unpaid amounts payable under this contract, and shall not be made to more than one party, except that an assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in the financing of this contract.

(c) The Contractor shall not furnish or disclose to any assignee under this contract any classified document (including this contract) or information related to work under this contract until the Contracting Officer authorizes such action in writing.

#### 52.232-27 PROMPT PAYMENT FOR CONSTRUCTION CONTRACTS (MAY 2001)

Notwithstanding any other payment terms in this contract, the Government will make invoice payments and contract financing payments under the terms and conditions specified in this clause. Payment shall be considered as being made on the day a check is dated or the date of an electronic funds transfer. Definitions of pertinent terms are set forth in sections 2.101 and 32.902 of the Federal Acquisition Regulation. All days referred to in this clause are calendar days, unless otherwise specified. (However, see subparagraph (a)(3) concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) Invoice payments. (1) Types of invoice payments. For purposes of this clause, there are several types of invoice payments that may occur under this contract, as follows:

(i) Progress payments, if provided for elsewhere in this contract, based on Contracting Officer approval of the estimated amount and value of work or services performed, including payments for reaching milestones in any project:

(A) The due date for making such payments shall be 14 days after receipt of the payment request by the designated billing office. If the designated billing office fails to annotate the payment request with the actual date of receipt at the time of receipt, the payment due date shall be the 14th day after the date of the Contractor's payment request, provided a proper payment request is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) The due date for payment of any amounts retained by the Contracting Officer in accordance with the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts, shall be as specified in the contract or, if not specified, 30 days after approval for release to the Contractor by the Contracting Officer.

(ii) Final payments based on completion and acceptance of all work and presentation of release of all claims against the Government arising by virtue of the contract, and payments for partial deliveries that have been accepted by the Government (e.g., each separate building, public work, or other division of the contract for which the price is stated separately in the contract):

(A) The due date for making such payments shall be either the 30th day after receipt by the designated billing office of a proper invoice from the Contractor, or the 30th day after Government acceptance of the work or services completed by the Contractor, whichever is later. If the designated billing office fails to annotate the invoice with the date of actual receipt at the time of receipt, the invoice payment due date shall be the 30th day after the date of the Contractor's invoice, provided a proper invoice is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) On a final invoice where the payment amount is subject to contract settlement actions (e.g., release of claims), acceptance shall be deemed to have occurred on the effective date of the contract settlement.

(2) Contractor's invoice. The Contractor shall prepare and submit invoices to the designated billing office specified in the contract. A proper invoice must include the items listed in subdivisions (a)(2)(i) through (a)(2)(ix) of this clause. If the invoice does not comply with these requirements, it shall be returned within 7 days after the date the designated billing office received the invoice, with a statement of the reasons why it is not a proper invoice. Untimely notification will be taken into account in computing any interest penalty owed the Contractor in the manner described in subparagraph (a)(4) of this clause.

- (i) Name and address of the Contractor.
  - (ii) Invoice date. (The Contractor is encouraged to date invoices as close as possible to the date of mailing or transmission.)
  - (iii) Contract number or other authorization for work or services performed (including order number and contract line item number).
  - (iv) Description of work or services performed.
  - (v) Delivery and payment terms (e.g., prompt payment discount terms).
  - (vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).
  - (vii) Name (where practicable), title, phone number, and mailing address of person to be notified in the event of a defective invoice.
  - (viii) For payments described in subdivision (a)(1)(i) of this clause, substantiation of the amounts requested and certification in accordance with the requirements of the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts.
  - (ix) Any other information or documentation required by the contract.
  - (x) While not required, the Contractor is strongly encouraged to assign an identification number to each invoice.
- (3) Interest penalty. An interest penalty shall be paid automatically by the designated payment office, without request from the Contractor, if payment is not made by the due date and the conditions listed in subdivisions (a)(3)(i) through (a)(3)(iii) of this clause are met, if applicable. However, when the due date falls on a Saturday, Sunday, or legal holiday when Federal Government offices are closed and Government business is not expected to be conducted, payment may be made on the following business day without incurring a late payment interest penalty.
- (i) A proper invoice was received by the designated billing office.
  - (ii) A receiving report or other Government documentation authorizing payment was processed and there was no disagreement over quantity, quality, Contractor compliance with any contract term or condition, or requested progress payment amount.
  - (iii) In the case of a final invoice for any balance of funds due the Contractor for work or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.
- (4) Computing penalty amount. The interest penalty shall be at the rate established by the Secretary of the Treasury under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) that is in effect on the day after the due date, except where the interest penalty is prescribed by other governmental authority (e.g., tariffs). This rate is referred to as the "Renegotiation Board Interest Rate," and it is published in the Federal Register semiannually on or about January 1 and July 1. The interest penalty shall accrue daily on the invoice principal payment amount approved by the Government until the payment date of such approved principal amount; and will be compounded in 30-day increments inclusive from the first day after the due date through the payment date. That is, interest accrued at the end of any 30-day period will be added to the approved invoice principal payment amount and will be subject to interest penalties if not paid in the succeeding 30-day period. If the designated billing office failed to notify the Contractor of a defective invoice within the periods prescribed in subparagraph (a)(2) of this clause, the due date on the corrected invoice will be adjusted by subtracting from such date the number of days taken beyond the prescribed notification of defects period. Any interest penalty owed the Contractor will be based on this adjusted due date. Adjustments will be made by the designated payment office for errors in calculating interest penalties.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor for payments described in subdivision (a)(1)(ii) of this clause, Government acceptance or approval shall be deemed to have occurred constructively on the 7th day after the Contractor has completed the work or services in accordance with the terms and conditions of the contract. In the event that actual acceptance or approval occurs within the constructive acceptance or approval period, the determination of an interest penalty shall be based on the actual date of acceptance or approval. Constructive acceptance or constructive approval requirements do not apply if there is a disagreement over quantity, quality, or Contractor compliance with a contract provision. These requirements also do not compel Government officials to accept work or services, approve Contractor estimates, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The following periods of time will not be included in the determination of an interest penalty:

(A) The period taken to notify the Contractor of defects in invoices submitted to the Government, but this may not exceed 7 days.

(B) The period between the defects notice and resubmission of the corrected invoice by the Contractor.

(C) For incorrect electronic funds transfer (EFT) information, in accordance with the EFT clause of this contract.

(iii) Interest penalties will not continue to accrue after the filing of a claim for such penalties under the clause at 52.233-1, Disputes, or for more than 1 year. Interest penalties of less than \$1 need not be paid.

(iv) Interest penalties are not required on payment delays due to disagreement between the Government and the Contractor over the payment amount or other issues involving contract compliance, or on amounts temporarily withheld or retained in accordance with the terms of the contract. Claims involving disputes, and any interest that may be payable, will be resolved in accordance with the clause at 52.233-1, Disputes.

(5) Prompt payment discounts. An interest penalty also shall be paid automatically by the designated payment office, without request from the Contractor, if a discount for prompt payment is taken improperly. The interest penalty will be calculated on the amount of discount taken for the period beginning with the first day after the end of the discount period through the date when the Contractor is paid.

(6) Additional interest penalty. (i) If this contract was awarded on or after October 1, 1989, a penalty amount, calculated in accordance with subdivision (a)(6)(iii) of this clause, shall be paid in addition to the interest penalty amount if the Contractor--

(A) Is owed an interest penalty of \$1 or more;

(B) Is not paid the interest penalty within 10 days after the date the invoice amount is paid; and

(C) Makes a written demand to the designated payment office for additional penalty payment, in accordance with subdivision (a)(6)(ii) of this clause, postmarked not later than 40 days after the date the invoice amount is paid.

(ii)(A) Contractors shall support written demands for additional penalty payments with the following data. No additional data shall be required. Contractors shall--

(1) Specifically assert that late payment interest is due under a specific invoice, and request payment of all overdue late payment interest penalty and such additional penalty as may be required;

(2) Attach a copy of the invoice on which the unpaid late payment interest was due; and

(3) State that payment of the principal has been received, including the date of receipt.

(B) Demands must be postmarked on or before the 40th day after payment was made, except that--

(1) If the postmark is illegible or nonexistent, the demand must have been received and annotated with the date of receipt by the designated payment office on or before the 40th day after payment was made; or

(2) If the postmark is illegible or nonexistent and the designated payment office fails to make the required annotation, the demand's validity will be determined by the date the Contractor has placed on the demand; provided such date is no later than the 40th day after payment was made.

(iii)(A) The additional penalty shall be equal to 100 percent of any original late payment interest penalty, except--

(1) The additional penalty shall not exceed \$5,000;

(2) The additional penalty shall never be less than \$25; and

(3) No additional penalty is owed if the amount of the underlying interest penalty is less than \$1.

(B) If the interest penalty ceases to accrue in accordance with the limits stated in subdivision (a)(4)(iii) of this clause, the amount of the additional penalty shall be calculated on the amount of interest penalty that would have accrued in the absence of these limits, subject to the overall limits on the additional penalty specified in subdivision (a)(6)(iii)(A) of this clause.

(C) For determining the maximum and minimum additional penalties, the test shall be the interest penalty due on each separate payment made for each separate contract. The maximum and minimum additional penalty shall not be based upon individual invoices unless the invoices are paid separately. Where payments are consolidated for disbursing purposes, the maximum and minimum additional penalty determination shall be made separately for each contract therein.

(D) The additional penalty does not apply to payments regulated by other Government regulations (e.g., payments under utility contracts subject to tariffs and regulation).

(b) Contract financing payments. (1) Due dates for recurring financing payments. If this contract provides for contract financing, requests for payment shall be submitted to the designated billing office as specified in this contract or as directed by the Contracting Officer. Contract financing payments shall be made on the 30<sup>TH</sup> DAY after receipt of a proper contract financing request by the designated billing office. In the event that an audit or other review of a specific financing request is required to ensure compliance with the terms and conditions of the contract, the designated payment office is not compelled to make payment by the due date specified.

(2) Due dates for other contract financing. For advance payments, loans, or other arrangements that do not involve recurring submissions of contract financing requests, payment shall be made in accordance with the corresponding contract terms or as directed by the Contracting Officer.

(3) Interest penalty not applicable. Contract financing payments shall not be assessed an interest penalty for payment delays.

(c) Subcontract clause requirements. The Contractor shall include in each subcontract for property or services (including a material supplier) for the purpose of performing this contract the following:

(1) Prompt payment for subcontractors. A payment clause that obligates the Contractor to pay the subcontractor for satisfactory performance under its subcontract not later than 7 days from receipt of payment out of such amounts as are paid to the Contractor under this contract.

(2) Interest for subcontractors. An interest penalty clause that obligates the Contractor to pay to the subcontractor an interest penalty for each payment not made in accordance with the payment clause--

(i) For the period beginning on the day after the required payment date and ending on the date on which payment of

the amount due is made; and

(ii) Computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(3) Subcontractor clause flowdown. A clause requiring each subcontractor to include a payment clause and an interest penalty clause conforming to the standards set forth in subparagraphs (c)(1) and (c)(2) of this clause in each of its subcontracts, and to require each of its subcontractors to include such clauses in their subcontracts with each lower-tier subcontractor or supplier.

(d) Subcontract clause interpretation. The clauses required by paragraph (c) of this clause shall not be construed to impair the right of the Contractor or a subcontractor at any tier to negotiate, and to include in their subcontract, provisions that--

(1) Retainage permitted. Permit the Contractor or a subcontractor to retain (without cause) a specified percentage of each progress payment otherwise due to a subcontractor for satisfactory performance under the subcontract without incurring any obligation to pay a late payment interest penalty, in accordance with terms and conditions agreed to by the parties to the subcontract, giving such recognition as the parties deem appropriate to the ability of a subcontractor to furnish a performance bond and a payment bond;

(2) Withholding permitted. Permit the Contractor or subcontractor to make a determination that part or all of the subcontractor's request for payment may be withheld in accordance with the subcontract agreement; and

(3) Withholding requirements. Permit such withholding without incurring any obligation to pay a late payment penalty if--

(i) A notice conforming to the standards of paragraph (g) of this clause previously has been furnished to the subcontractor; and

(ii) A copy of any notice issued by a Contractor pursuant to subdivision (d)(3)(i) of this clause has been furnished to the Contracting Officer.

(e) Subcontractor withholding procedures. If a Contractor, after making a request for payment to the Government but before making a payment to a subcontractor for the subcontractor's performance covered by the payment request, discovers that all or a portion of the payment otherwise due such subcontractor is subject to withholding from the subcontractor in accordance with the subcontract agreement, then the Contractor shall--

(1) Subcontractor notice. Furnish to the subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon ascertaining the cause giving rise to a withholding, but prior to the due date for subcontractor payment;

(2) Contracting Officer notice. Furnish to the Contracting Officer, as soon as practicable, a copy of the notice furnished to the subcontractor pursuant to subparagraph (e)(1) of this clause;

(3) Subcontractor progress payment reduction. Reduce the subcontractor's progress payment by an amount not to exceed the amount specified in the notice of withholding furnished under subparagraph (e)(1) of this clause;

(4) Subsequent subcontractor payment. Pay the subcontractor as soon as practicable after the correction of the identified subcontract performance deficiency, and--

(i) Make such payment within--

(A) Seven days after correction of the identified subcontract performance deficiency (unless the funds therefor must be recovered from the Government because of a reduction under subdivision (e)(5)(i) of this clause; or

(B) Seven days after the Contractor recovers such funds from the Government; or

(ii) Incur an obligation to pay a late payment interest penalty computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty;

(5) Notice to Contracting Officer. Notify the Contracting Officer upon--

(i) Reduction of the amount of any subsequent certified application for payment; or

(ii) Payment to the subcontractor of any withheld amounts of a progress payment, specifying--

(A) The amounts withheld under subparagraph (e)(1) of this clause; and

(B) The dates that such withholding began and ended; and

(6) Interest to Government. Be obligated to pay to the Government an amount equal to interest on the withheld payments (computed in the manner provided in 31 U.S.C. 3903(c)(1)), from the 8th day after receipt of the withheld amounts from the Government until--

(i) The day the identified subcontractor performance deficiency is corrected; or

(ii) The date that any subsequent payment is reduced under subdivision (e)(5)(i) of this clause.

(f) Third-party deficiency reports. (1) Withholding from subcontractor. If a Contractor, after making payment to a first-tier subcontractor, receives from a supplier or subcontractor of the first-tier subcontractor (hereafter referred to as a "second-tier subcontractor") a written notice in accordance with section 2 of the Act of August 24, 1935 (40 U.S.C. 270b, Miller Act), asserting a deficiency in such first-tier subcontractor's performance under the contract for which the Contractor may be ultimately liable, and the Contractor determines that all or a portion of future payments otherwise due such first-tier subcontractor is subject to withholding in accordance with the subcontract agreement, the Contractor may, without incurring an obligation to pay an interest penalty under subparagraph (e)(6) of this clause--

(i) Furnish to the first-tier subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon making such determination; and

(ii) Withhold from the first-tier subcontractor's next available progress payment or payments an amount not to exceed the amount specified in the notice of withholding furnished under subdivision (f)(1)(i) of this clause.

(2) Subsequent payment or interest charge. As soon as practicable, but not later than 7 days after receipt of satisfactory written notification that the identified subcontract performance deficiency has been corrected, the Contractor shall--

(i) Pay the amount withheld under subdivision (f)(1)(ii) of this clause to such first-tier subcontractor; or

(ii) Incur an obligation to pay a late payment interest penalty to such first-tier subcontractor computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(g) Written notice of subcontractor withholding. A written notice of any withholding shall be issued to a subcontractor (with a copy to the Contracting Officer of any such notice issued by the Contractor), specifying--

- (1) The amount to be withheld;
  - (2) The specific causes for the withholding under the terms of the subcontract; and
  - (3) The remedial actions to be taken by the subcontractor in order to receive payment of the amounts withheld.
- (h) Subcontractor payment entitlement. The Contractor may not request payment from the Government of any amount withheld or retained in accordance with paragraph (d) of this clause until such time as the Contractor has determined and certified to the Contracting Officer that the subcontractor is entitled to the payment of such amount.
- (i) Prime-subcontractor disputes. A dispute between the Contractor and subcontractor relating to the amount or entitlement of a subcontractor to a payment or a late payment interest penalty under a clause included in the subcontract pursuant to paragraph (c) of this clause does not constitute a dispute to which the United States is a party. The United States may not be interpleaded in any judicial or administrative proceeding involving such a dispute.
- (j) Preservation of prime-subcontractor rights. Except as provided in paragraph (i) of this clause, this clause shall not limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or a subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or nonperformance by a subcontractor.
- (k) Non-recourse for prime contractor interest penalty. The Contractor's obligation to pay an interest penalty to a subcontractor pursuant to the clauses included in a subcontract under paragraph (c) of this clause shall not be construed to be an obligation of the United States for such interest penalty. A cost-reimbursement claim may not include any amount for reimbursement of such interest penalty.

#### 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER—CENTRAL CONTRACTOR REGISTRATION (MAY 1999)

- (a) Method of payment. (1) All payments by the Government under this contract shall be made by electronic funds transfer (EFT), except as provided in paragraph (a)(2) of this clause. As used in this clause, the term "EFT" refers to the funds transfer and may also include the payment information transfer.
- (2) In the event the Government is unable to release one or more payments by EFT, the Contractor agrees to either--
- (i) Accept payment by check or some other mutually agreeable method of payment; or
  - (ii) Request the Government to extend the payment due date until such time as the Government can make payment by EFT (but see paragraph (d) of this clause).
- (b) Contractor's EFT information. The Government shall make payment to the Contractor using the EFT information contained in the Central Contractor Registration (CCR) database. In the event that the EFT information changes, the Contractor shall be responsible for providing the updated information to the CCR database.
- (c) Mechanisms for EFT payment. The Government may make payment by EFT through either the Automated Clearing House (ACH) network, subject to the rules of the National Automated Clearing House Association, or the Fedwire Transfer System. The rules governing Federal payments through the ACH are contained in 31 CFR part 210.
- (d) Suspension of payment. If the Contractor's EFT information in the CCR database is incorrect, then the Government need not make payment to the Contractor under this contract until correct EFT information is entered into the CCR database; and any invoice or contract financing request shall be deemed not to be a proper invoice for the purpose of prompt payment under this contract. The prompt payment terms of the contract regarding notice of an improper invoice and delays in accrual of interest penalties apply.

(e) Contractor EFT arrangements. If the Contractor has identified multiple payment receiving points (i.e., more than one remittance address and/or EFT information set) in the CCR database, and the Contractor has not notified the Government of the payment receiving point applicable to this contract, the Government shall make payment to the first payment receiving point (EFT information set or remittance address as applicable) listed in the CCR database.

(f) Liability for uncompleted or erroneous transfers. (1) If an uncompleted or erroneous transfer occurs because the Government used the Contractor's EFT information incorrectly, the Government remains responsible for--

(i) Making a correct payment;

(ii) Paying any prompt payment penalty due; and

(iii) Recovering any erroneously directed funds.

(2) If an uncompleted or erroneous transfer occurs because the Contractor's EFT information was incorrect, or was revised within 30 days of Government release of the EFT payment transaction instruction to the Federal Reserve System, and--

(i) If the funds are no longer under the control of the payment office, the Government is deemed to have made payment and the Contractor is responsible for recovery of any erroneously directed funds; or

(ii) If the funds remain under the control of the payment office, the Government shall not make payment, and the provisions of paragraph (d) of this clause shall apply.

(g) EFT and prompt payment. A payment shall be deemed to have been made in a timely manner in accordance with the prompt payment terms of this contract if, in the EFT payment transaction instruction released to the Federal Reserve System, the date specified for settlement of the payment is on or before the prompt payment due date, provided the specified payment date is a valid date under the rules of the Federal Reserve System.

(h) EFT and assignment of claims. If the Contractor assigns the proceeds of this contract as provided for in the assignment of claims terms of this contract, the Contractor shall require as a condition of any such assignment, that the assignee shall register in the CCR database and shall be paid by EFT in accordance with the terms of this clause. In all respects, the requirements of this clause shall apply to the assignee as if it were the Contractor. EFT information that shows the ultimate recipient of the transfer to be other than the Contractor, in the absence of a proper assignment of claims acceptable to the Government, is incorrect EFT information within the meaning of paragraph (d) of this clause.

(i) Liability for change of EFT information by financial agent. The Government is not liable for errors resulting from changes to EFT information made by the Contractor's financial agent.

(j) Payment information. The payment or disbursing office shall forward to the Contractor available payment information that is suitable for transmission as of the date of release of the EFT instruction to the Federal Reserve System. The Government may request the Contractor to designate a desired format and method(s) for delivery of payment information from a list of formats and methods the payment office is capable of executing. However, the Government does not guarantee that any particular format or method of delivery is available at any particular payment office and retains the latitude to use the format and delivery method most convenient to the Government. If the Government makes payment by check in accordance with paragraph (a) of this clause, the Government shall mail the payment information to the remittance address contained in the CCR database.

(End of Clause)

52.233-1 DISPUTES. (DEC 1998)

(a) This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613).

(b) Except as provided in the Act, all disputes arising under or relating to this contract shall be resolved under this clause.

(c) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract. A claim arising under a contract, unlike a claim relating to that contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. However, a written demand or written assertion by the Contractor seeking the payment of money exceeding \$100,000 is not a claim under the Act until certified as required by subparagraph (d)(2) of this clause. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under the Act. The submission may be converted to a claim under the Act, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(d)(1) A claim by the Contractor shall be made in writing and, unless otherwise stated in this contract, submitted within 6 years after accrual of the claim to the Contracting Officer for a written decision. A claim by the Government against the Contractor shall be subject to a written decision by the Contracting Officer.

(2)(i) The contractors shall provide the certification specified in subparagraph (d)(2)(iii) of this clause when submitting any claim -

(A) Exceeding \$100,000; or

(B) Regardless of the amount claimed, when using -

(1) Arbitration conducted pursuant to 5 U.S.C. 575-580; or

(2) Any other alternative means of dispute resolution (ADR) technique that the agency elects to handle in accordance with the Administrative Dispute Resolution Act (ADRA).

(ii) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.

(iii) The certification shall state as follows: "I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable; and that I am duly authorized to certify the claim on behalf of the Contractor.

(3) The certification may be executed by any person duly authorized to bind the Contractor with respect to the claim.

(e) For Contractor claims of \$100,000 or less, the Contracting Officer must, if requested in writing by the Contractor, render a decision within 60 days of the request. For Contractor-certified claims over \$100,000, the Contracting Officer must, within 60 days, decide the claim or notify the Contractor of the date by which the decision will be made.

(f) The Contracting Officer's decision shall be final unless the Contractor appeals or files a suit as provided in the Act.

(g) If the claim by the Contractor is submitted to the Contracting Officer or a claim by the Government is presented to the Contractor, the parties, by mutual consent, may agree to use alternative dispute resolution (ADR). If the Contractor refuses an offer for ADR, the Contractor shall inform the Contracting Officer, in writing, of the Contractor's specific reasons for rejecting the request.

(h) The Government shall pay interest on the amount found due and unpaid from (1) the date the Contracting Officer receives the claim (certified, if required); or (2) the date that payment otherwise would be due, if that date is later,

until the date of payment. With regard to claims having defective certifications, as defined in (FAR) 48 CFR 33.201, interest shall be paid from the date that the Contracting Officer initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Contracting Officer receives the claim and then at the rate applicable for each 6-month period as fixed by the Treasury Secretary during the pendency of the claim.

(i) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under the contract, and comply with any decision of the Contracting Officer.

(End of clause)

#### 52.233-3 PROTEST AFTER AWARD (AUG. 1996)

(a) Upon receipt of a notice of protest (as defined in FAR 33.101) or a determination that a protest is likely (see FAR 33.102(d)), the Contracting Officer may, by written order to the Contractor, direct the Contractor to stop performance of the work called for by this contract. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Upon receipt of the final decision in the protest, the Contracting Officer shall either--

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Default, or the Termination for Convenience of the Government, clause of this contract.

(b) If a stop-work order issued under this clause is canceled either before or after a final decision in the protest, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule or contract price, or both, and the contract shall be modified, in writing, accordingly, if--

(1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and

(2) The Contractor asserts its right to an adjustment within 30 days after the end of the period of work stoppage; provided, that if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon a proposal at any time before final payment under this contract.

(c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

(e) The Government's rights to terminate this contract at any time are not affected by action taken under this clause.

(f) If, as the result of the Contractor's intentional or negligent misstatement, misrepresentation, or miscertification, a protest related to this contract is sustained, and the Government pays costs, as provided in FAR 33.102(b)(2) or 33.104(h)(1), the Government may require the Contractor to reimburse the Government the amount of such costs. In addition to any other remedy available, and pursuant to the requirements of Subpart 32.6, the Government may collect this debt by offsetting the amount against any payment due the Contractor under any contract between the Contractor and the Government.

**52.236-2 DIFFERING SITE CONDITIONS (APR 1984)**

(a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of

(1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or

(2) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

**52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)**

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to

(1) conditions bearing upon transportation, disposal, handling, and storage of materials;

(2) the availability of labor, water, electric power, and roads;

(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site;

(4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

(b) The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

**52.236-5 MATERIAL AND WORKMANSHIP (APR 1984)**

(a) All equipment, material, and articles incorporated into the work covered by this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in

the specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

(b) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. When directed to do so, the Contractor shall submit samples for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

(c) All work under this contract shall be performed in a skillful and workmanlike manner. The Contracting Officer may require, in writing, that the Contractor remove from the work any employee the Contracting Officer deems incompetent, careless, or otherwise objectionable.

#### 52.236-6 SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)

At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the worksite a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.

#### 52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work. The Contractor shall also be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.

#### 52.236-8 OTHER CONTRACTS (APR 1984)

The Government may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with Government employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by Government employees.

#### 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)

(a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during

contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

(b) The Contractor shall protect from damage all existing improvements and utilities

(1) at or near the work site, and

(2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

#### 52.236-10 OPERATIONS AND STORAGE AREAS (APR 1984)

(a) The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

(b) Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.

(c) The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

#### 52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)

(a) The Government shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Government intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Government's possession or use shall not be deemed an acceptance of any work under the contract.

(b) While the Government has such possession or use, the Contractor shall be relieved of the responsibility for the loss of or damage to the work resulting from the Government's possession or use, notwithstanding the terms of the clause in this contract entitled "Permits and Responsibilities." If prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

#### 52.236-12 CLEANING UP (APR 1984)

The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the work, the Contractor shall remove from the work and premises any rubbish, tools,

scaffolding, equipment, and materials that are not the property of the Government. Upon completing the work, the Contractor shall leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer.

#### 52.236-13 ACCIDENT PREVENTION (NOV 1991)

(a) The Contractor shall provide and maintain work environments and procedures which will

(1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities;

(2) avoid interruptions of Government operations and delays in project completion dates; and

(3) control costs in the performance of this contract.

(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall-

(1) Provide appropriate safety barricades, signs, and signal lights;

(2) Comply with the standards issued by the Secretary of Labor at 29 CFR Part 1926 and 29 CFR Part 1910; and

(3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for the purposes are taken.

(c) If this contract is for construction or dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.

(d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.

(e) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontracts.

#### 52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)

(a) The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the

Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

#### 52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)

(a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring materials, plant, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

(b) The Contractor shall enter the actual progress on the chart as directed by the Contracting Officer, and upon doing so shall immediately deliver three copies of the annotated schedule to the Contracting Officer. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of this contract.

#### 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997)

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the "direction", "requirement", "order", "designation", or "prescription", of the Contracting Officer is intended and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean "approved by," or "acceptable to", or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown," "as indicated", "as detailed", or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place," that is "furnished and installed".

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail (1) the proposed fabrication and assembly of structural elements, and (2) the installation (i.e., fit, and attachment details) of materials or equipment. It includes

drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the contractor to explain in detail specific portions of the work required by the contract. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the Government's reasons therefor. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation, the Contracting Officer shall issue an appropriate contract modification, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the Contracting Officer and one set will be returned to the Contractor.

#### 52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)

If the Contracting Officer decides to conduct a preconstruction conference, the successful offeror will be notified and will be required to attend. The Contracting Officer's notification will include specific details regarding the date, time, and location of the conference, any need for attendance by subcontractors, and information regarding the items to be discussed.

#### 52.242-13 BANKRUPTCY (JUL 1995)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail or electronic commerce method authorized by the contract, written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting offices for all Government contracts against which final payment has not been made. This obligation remains in effect until final payment under this contract.

(End of clause)

#### 52.242-14 SUSPENSION OF WORK (APR 1984)

(a) The Contracting Officer may order the Contractor, in writing, to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the Government.

(b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified in this contract (or within a reasonable time if not specified), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by the unreasonable suspension, delay, or interruption, and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an equitable adjustment is provided for or excluded under any other term or condition of this contract. (c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order), and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

#### 52.243-4 CHANGES (AUG 1987)

(a) The Contracting Officer may, at any time, without notice to the sureties, if any, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including changes--

- (1) In the specifications (including drawings and designs);
- (2) In the method or manner of performance of the work;
- (3) In the Government-furnished facilities, equipment, materials, services, or site; or
- (4) Directing acceleration in the performance of the work.

(b) Any other written or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating

- (1) the date, circumstances, and source of the order and
- (2) that the Contractor regards the order as a change order.

(c) Except as provided in this clause, no order, statement, or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for an adjustment based on defective specifications, no adjustment for any change under paragraph (b) of this clause shall be made for any costs incurred more than 20 days before the Contractor gives written notice as required. In the case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

(e) The Contractor must assert its right to an adjustment under this clause within 30 days after

(1) receipt of a written change order under paragraph (a) of this clause or (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting to the Contracting Officer a written statement describing the general nature and amount of the proposal, unless this period is extended by the Government. The statement of proposal for adjustment may be included in the notice under paragraph (b) above.

(f) No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

#### 52.243-5 CHANGES AND CHANGED CONDITIONS (APR 1984)

(a) The Contracting Officer may, in writing, order changes in the drawings and specifications within the general scope of the contract.

(b) The Contractor shall promptly notify the Contracting Officer, in writing, of subsurface or latent physical conditions differing materially from those indicated in this contract or unknown unusual physical conditions at the site before proceeding with the work.

(c) If changes under paragraph (a) or conditions under paragraph (b) increase or decrease the cost of, or time required for performing the work, the Contracting Officer shall make an equitable adjustment (see paragraph (d)) upon submittal of a "proposal for adjustment" (hereafter referred to as proposal) by the Contractor before final payment under the contract.

(d) The Contracting Officer shall not make an equitable adjustment under paragraph (b) unless--

(1) The Contractor has submitted and the Contracting Officer has received the required written notice; or

(2) The Contracting Officer waives the requirement for the written notice.

(e) Failure to agree to any adjustment shall be a dispute under the Disputes clause.

#### 52.244-2 SUBCONTRACTS (AUG 1998)

(a) Definitions. As used in this clause--

Approved purchasing system means a Contractor's purchasing system that has been reviewed and approved in accordance with Part 44 of the Federal Acquisition Regulation (FAR).

Consent to subcontract means the Contracting Officer's written consent for the Contractor to enter into a particular subcontract.

Subcontract means any contract, as defined in FAR Subpart 2.1, entered into by a subcontractor to furnish supplies or services for performance of the prime contract or a subcontract. It includes, but is not limited to, purchase orders, and changes and modifications to purchase orders.

(b) This clause does not apply to subcontracts for special test equipment when the contract contains the clause at FAR 52.245-18, Special Test Equipment.

(c) When this clause is included in a fixed-price type contract, consent to subcontract is required only on unpriced contract actions (including unpriced modifications or unpriced delivery orders), and only if required in accordance with paragraph (d) or (e) of this clause.

(d) If the Contractor does not have an approved purchasing system, consent to subcontract is required for any subcontract that--

(1) Is of the cost-reimbursement, time-and-materials, or labor-hour type; or

(2) Is fixed-price and exceeds--

(i) For a contract awarded by the Department of Defense, the Coast Guard, or the National Aeronautics and Space Administration, the greater of the simplified acquisition threshold or 5 percent of the total estimated cost of the contract; or

(ii) For a contract awarded by a civilian agency other than the Coast Guard and the National Aeronautics and Space Administration, either the simplified acquisition threshold or 5 percent of the total estimated cost of the contract.

(e) If the Contractor has an approved purchasing system, the Contractor nevertheless shall obtain the Contracting Officer's written consent before placing the following subcontracts:

(f)(1) The Contractor shall notify the Contracting Officer reasonably in advance of placing any subcontract or modification thereof for which consent is required under paragraph (c), (d), or (e) of this clause, including the following information:

(i) A description of the supplies or services to be subcontracted.

(ii) Identification of the type of subcontract to be used.

(iii) Identification of the proposed subcontractor.

(iv) The proposed subcontract price.

(v) The subcontractor's current, complete, and accurate cost or pricing data and Certificate of Current Cost or Pricing Data, if required by other contract provisions.

(vi) The subcontractor's Disclosure Statement or Certificate relating to Cost Accounting Standards when such data are required by other provisions of this contract.

(vii) A negotiation memorandum reflecting--

(A) The principal elements of the subcontract price negotiations;

(B) The most significant considerations controlling establishment of initial or revised prices;

(C) The reason cost or pricing data were or were not required;

(D) The extent, if any, to which the Contractor did not rely on the subcontractor's cost or pricing data in determining the price objective and in negotiating the final price;

(E) The extent to which it was recognized in the negotiation that the subcontractor's cost or pricing data were not accurate, complete, or current; the action taken by the Contractor and the subcontractor; and the effect of any such defective data on the total price negotiated;

(F) The reasons for any significant difference between the Contractor's price objective and the price negotiated; and

(G) A complete explanation of the incentive fee or profit plan when incentives are used. The explanation shall identify each critical performance element, management decisions used to quantify each incentive element, reasons for the incentives, and a summary of all trade-off possibilities considered.

(2) The Contractor is not required to notify the Contracting Officer in advance of entering into any subcontract for which consent is not required under paragraph (c), (d), or (e) of this clause.

(g) Unless the consent or approval specifically provides otherwise, neither consent by the Contracting Officer to any

subcontract nor approval of the Contractor's purchasing system shall constitute a determination--

(1) Of the acceptability of any subcontract terms or conditions;

(2) Of the allowability of any cost under this contract; or

(3) To relieve the Contractor of any responsibility for performing this contract.

(h) No subcontract or modification thereof placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost basis, and any fee payable under cost-reimbursement type subcontracts shall not exceed the fee limitations in FAR 15.404-4(c)(4)(i).

(i) The Contractor shall give the Contracting Officer immediate written notice of any action or suit filed and prompt notice of any claim made against the Contractor by any subcontractor or vendor that, in the opinion of the Contractor, may result in litigation related in any way to this contract, with respect to which the Contractor may be entitled to reimbursement from the Government.

(j) The Government reserves the right to review the Contractor's purchasing system as set forth in FAR Subpart 44.3.

(k) Paragraphs (d) and (f) of this clause do not apply to the following subcontracts, which were evaluated during negotiations:

(End of clause)

#### 52.246-12 INSPECTION OF CONSTRUCTION (AUG 1996)

(a) Definition. "Work" includes, but is not limited to, materials, workmanship, and manufacture and fabrication of components.

(b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the Government. All work shall be conducted under the general direction of the Contracting Officer and is subject to Government inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.

(c) Government inspections and tests are for the sole benefit of the Government and do not--

(1) Relieve the Contractor of responsibility for providing adequate quality control measures;

(2) Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;

(3) Constitute or imply acceptance; or

(4) Affect the continuing rights of the Government after acceptance of the completed work under paragraph (i) of this section.

(d) The presence or absence of a Government inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specification without the Contracting Officer's written authorization.

(e) The Contractor shall promptly furnish, at no increase in contract price, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the

Contracting Officer. The Government may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The Government shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

(f) The Contractor shall, without charge, replace or correct work found by the Government not to conform to contract requirements, unless in the public interest the Government consents to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(g) If the Contractor does not promptly replace or correct rejected work, the Government may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor or (2) terminate for default the Contractor's right to proceed.

(h) If, before acceptance of the entire work, the Government decides to examine already completed work by removing it or tearing it out, the Contractor, on request, shall promptly furnish all necessary facilities, labor, and material. If the work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray the expenses of the examination and of satisfactory reconstruction. However, if the work is found to meet contract requirements, the Contracting Officer shall make an equitable adjustment for the additional services involved in the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

(i) Unless otherwise specified in the contract, the Government shall accept, as promptly as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the Government's rights under any warranty or guarantee.

#### 52.248-3 VALUE ENGINEERING--CONSTRUCTION (FEB 2000)

(a) General. The Contractor is encouraged to develop, prepare, and submit value engineering change proposals (VECP's) voluntarily. The Contractor shall share in any instant contract savings realized from accepted VECP's, in accordance with paragraph (f) below.

(b) Definitions. "Collateral costs," as used in this clause, means agency costs of operation, maintenance, logistic support, or Government-furnished property.

"Collateral savings," as used in this clause, means those measurable net reductions resulting from a VECP in the agency's overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.

"Contractor's development and implementation costs," as used in this clause, means those costs the Contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the Contractor incurs to make the contractual changes required by Government acceptance of a VECP.

"Government costs," as used in this clause, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistic support. The term does not include the normal administrative costs of processing the VECP.

"Instant contract savings," as used in this clause, means the estimated reduction in Contractor cost of performance resulting from acceptance of the VECP, minus allowable Contractor's development and implementation costs, including subcontractors' development and implementation costs (see paragraph (h) below).

"Value engineering change proposal (VECP)" means a proposal that--

- (1) Requires a change to this, the instant contract, to implement; and
  - (2) Results in reducing the contract price or estimated cost without impairing essential functions or characteristics; provided, that it does not involve a change--
    - (i) In deliverable end item quantities only; or
    - (ii) To the contract type only.
  - (c) VECP preparation. As a minimum, the Contractor shall include in each VECP the information described in subparagraphs (1) through (7) below. If the proposed change is affected by contractually required configuration management or similar procedures, the instructions in those procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:
    - (1) A description of the difference between the existing contract requirement and that proposed, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effect of the change on the end item's performance.
    - (2) A list and analysis of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revisions.
    - (3) A separate, detailed cost estimate for
      - (i) the affected portions of the existing contract requirement and
      - (ii) the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under paragraph (h) below.
    - (4) A description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.
    - (5) A prediction of any effects the proposed change would have on collateral costs to the agency.
    - (6) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.
    - (7) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.
  - (d) Submission. The Contractor shall submit VECP's to the Resident Engineer at the worksite, with a copy to the Contracting Officer.
  - (e) Government action.
    - (1) The Contracting Officer will notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required, the Contracting Officer will notify the Contractor within the 45-day period and provide the reason for the delay and the expected date of the decision. The Government will process VECP's expeditiously; however, it shall not be liable for any delay in acting upon a VECP.
- If the VECP is not accepted, the Contracting Officer will notify the Contractor in writing, explaining the reasons for rejection. The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Government. The Contracting Officer may require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.

Any VECP may be accepted, in whole or in part, by the Contracting Officer's award of a modification to this contract citing this clause. The Contracting Officer may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a contract modification applies a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The decision to accept or reject all or part of any VECP is a unilateral decision made solely at the discretion of the Contracting Officer.

(f) Sharing.

(1) Rates. The Government's share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by

(i) 45 percent for fixed-price contracts or

(ii) 75 percent for cost-reimbursement contracts.

(2) Payment. Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a modification to this contract to--

(i) Accept the VECP;

(ii) Reduce the contract price or estimated cost by the amount of instant contract savings; and

(iii) Provide the Contractor's share of savings by adding the amount calculated to the contract price or fee.

(g) Collateral savings. If a VECP is accepted, the Contracting Officer will increase the instant contract amount by 20 percent of any projected collateral savings determined to be realized in a typical year of use after subtracting any Government costs not previously offset. However, the Contractor's share of collateral savings will not exceed the contract's firm-fixed-price or estimated cost, at the time the VECP is accepted, or \$100,000, whichever is greater. The Contracting Officer is the sole determiner of the amount of collateral savings.

(h) Subcontracts. The Contractor shall include an appropriate value engineering clause in any subcontract of \$50,000 or more and may include one in subcontracts of lesser value. In computing any adjustment in this contract's price under paragraph (f) above, the Contractor's allowable development and implementation costs shall include any subcontractor's allowable development and implementation costs clearly resulting from a VECP accepted by the Government under this contract, but shall exclude any value engineering incentive payments to a subcontractor. The Contractor may choose any arrangement for subcontractor value engineering incentive payments; provided, that these payments shall not reduce the Government's share of the savings resulting from the VECP.

(i) Data. The Contractor may restrict the Government's right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:

"These data, furnished under the Value Engineering-- Construction clause of contract . . . . ., shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a value engineering change proposal submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations." If a VECP is accepted, the Contractor hereby grants the Government unlimited rights in the VECP and supporting data, except that, with respect to data qualifying and submitted as limited rights technical data, the Government shall have the rights specified in the contract modification implementing the VECP and shall appropriately mark the data. (The terms "unlimited rights" and "limited rights" are defined in Part 27 of the Federal Acquisition Regulation.)

(End of clause)

52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SEP 1996) -  
ALTERNATE I (SEP 1996)

(a) The Government may terminate performance of work under this contract in whole or, from time to time, in part if the Contracting Officer determines that a termination is in the Government's interest. The Contracting Officer shall terminate by delivering to the Contractor a Notice of Termination specifying the extent of termination and the effective date.

(b) After receipt of a Notice of Termination, and except as directed by the Contracting Officer, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due under this clause:

(1) Stop work as specified in the notice.

(2) Place no further subcontracts or orders (referred to as subcontracts in this clause) for materials, services, or facilities, except as necessary to complete the continued portion of the contract.

(3) Terminate all subcontracts to the extent they relate to the work terminated.

(4) Assign to the Government, as directed by the Contracting Officer, all right, title, and interest of the Contractor under the subcontracts terminated, in which case the Government shall have the right to settle or to pay any termination settlement proposal arising out of those terminations.

(5) With approval or ratification to the extent required by the Contracting Officer, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts; the approval or ratification will be final for purposes of this clause.

(6) As directed by the Contracting Officer, transfer title and deliver to the Government (i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated, and (ii) the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the Government.

(7) Complete performance of the work not terminated.

(8) Take any action that may be necessary, or that the Contracting Officer may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the Government has or may acquire an interest.

(9) Use its best efforts to sell, as directed or authorized by the Contracting Officer, any property of the types referred to in subparagraph (b)(6) of this clause; provided, however, that the Contractor (i) is not required to extend credit to any purchaser and (ii) may acquire the property under the conditions prescribed by, and at prices approved by, the Contracting Officer. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Government under this contract, credited to the price or cost of the work, or paid in any other manner directed by the Contracting Officer.

(c) The Contractor shall submit complete termination inventory schedules no later than 120 days from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 120-day period.

(d) After expiration of the plant clearance period as defined in Subpart 45.6 of the Federal Acquisition Regulation, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by the Contracting Officer. The Contractor may request the Government to remove those items or enter into an agreement for their storage. Within 15 days, the Government will accept title to those items and remove them or enter into a storage agreement. The

Contracting Officer may verify the list upon removal of the items, or if stored, within 45 days from submission of the list, and shall correct the list, as necessary, before final settlement.

(e) After termination, the Contractor shall submit a final termination settlement proposal to the Contracting Officer in the form and with the certification prescribed by the Contracting Officer. The Contractor shall submit the proposal promptly, but no later than 1 year from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 1-year period. However, if the Contracting Officer determines that the facts justify it, a termination settlement proposal may be received and acted on after 1 year or any extension. If the Contractor fails to submit the proposal within the time allowed, the Contracting Officer may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

(f) Subject to paragraph (e) of this clause, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount to be paid or remaining to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whether under this paragraph (g) or paragraph (g) of this clause, exclusive of costs shown in subparagraph (g)(3) of this clause, may not exceed the total contract price as reduced by (1) the amount of payments previously made and (2) the contract price of work not terminated. The contract shall be modified, and the Contractor paid the agreed amount. Paragraph (g) of this clause shall not limit, restrict, or affect the amount that may be agreed upon to be paid under this paragraph.

(g) If the Contractor and Contracting Officer fail to agree on the whole amount to be paid the Contractor because of the termination of work, the Contracting Officer shall pay the Contractor the amounts determined as follows, but without duplication of any amounts agreed upon under paragraph (f) of this clause:

(1) For contract work performed before the effective date of termination, the total (without duplication of any items) of--

(i) The cost of this work;

(ii) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (g)(1)(i) of this clause; and

(iii) A sum, as profit on subdivision (g)(1)(i) of this clause, determined by the Contracting Officer under 49.202 of the Federal Acquisition Regulation, in effect on the date of this contract, to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, the Contracting Officer shall allow no profit under this subdivision (iii) and shall reduce the settlement to reflect the indicated rate of loss.

(2) The reasonable costs of settlement of the work terminated, including--

(i) Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data;

(ii) The termination and settlement of subcontracts (excluding the amounts of such settlements); and

(iii) Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

(h) Except for normal spoilage, and except to the extent that the Government expressly assumed the risk of loss, the Contracting Officer shall exclude from the amounts payable to the Contractor under paragraph (g) of this clause, the fair value, as determined by the Contracting Officer, of property that is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government or to a buyer.

(i) The cost principles and procedures of Part 31 of the Federal Acquisition Regulation, in effect on the date of this contract, shall govern all costs claimed, agreed to, or determined under this clause.

(j) The Contractor shall have the right of appeal, under the Disputes clause, from any determination made by the Contracting Officer under paragraph (e), (g), or (l) of this clause, except that if the Contractor failed to submit the termination settlement proposal or request for equitable adjustment within the time provided in paragraph (e) or (l), respectively, and failed to request a time extension, there is no right of appeal.

(k) In arriving at the amount due the Contractor under this clause, there shall be deducted--

(1) All unliquidated advance or other payments to the Contractor under the terminated portion of this contract;

(2) Any claim which the Government has against the Contractor under this contract; and

(3) The agreed price for, or the proceeds of sale of, materials, supplies, or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the Government.

(l) If the termination is partial, the Contractor may file a proposal with the Contracting Officer for an equitable adjustment of the price(s) of the continued portion of the contract. The Contracting Officer shall make any equitable adjustment agreed upon. Any proposal by the Contractor for an equitable adjustment under this clause shall be requested within 90 days from the effective date of termination unless extended in writing by the Contracting Officer.

(m)(1) The Government may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the contract, if the Contracting Officer believes the total of these payments will not exceed the amount to which the Contractor will be entitled.

(2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination settlement proposal because of retention or other disposition of termination inventory until 10 days after the date of the retention or disposition, or a later date determined by the Contracting Officer because of the circumstances.

(n) Unless otherwise provided in this contract or by statute, the Contractor shall maintain all records and documents relating to the terminated portion of this contract for 3 years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this contract. The Contractor shall make these records and documents available to the Government, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents.

#### 52.249-10 DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)

(a) If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified in this contract including any extension, or fails to complete the work within this time, the Government may, by written notice to the Contractor, terminate the right to proceed with the work (or the separable part of the work) that has been delayed. In this event, the Government may take over the work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Government resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Government in completing the work.

(b) The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this clause, if--

(1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include

(i) acts of God or of the public enemy,

(ii) acts of the Government in either its sovereign or contractual capacity,

(iii) acts of another Contractor in the performance of a contract with the Government,

(iv) fires,

(v) floods,

(vi) epidemics,

(vii) quarantine restrictions,

(viii) strikes,

(ix) freight embargoes,

(x) unusually severe weather, or delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within 10 days from the beginning of any delay (unless extended by the Contracting Officer), notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, the time for completing the work shall be extended. The findings of the Contracting Officer shall be final and conclusive on the parties, but subject to appeal under the Disputes clause.

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the Government.

The rights and remedies of the Government in this clause are in addition to any other rights and remedies provided by law or under this contract.

#### 52.253-1 COMPUTER GENERATED FORMS (JAN 1991)

(a) Any data required to be submitted on a Standard or Optional Form prescribed by the Federal Acquisition Regulation (FAR) may be submitted on a computer generated version of the form, provided there is no change to the name, content, or sequence of the data elements on the form, and provided the form carries the Standard or Optional Form number and edition date.

(b) Unless prohibited by agency regulations, any data required to be submitted on an agency unique form prescribed by an agency supplement to the FAR may be submitted on a computer generated version of the form provided there is no change to the name, content, or sequence of the data elements on the form and provided the form carries the agency form number and edition date.

(c) If the Contractor submits a computer generated version of a form that is different than the required form, then the rights and obligations of the parties will be determined based on the content of the required form.

## 252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)

(a) "Definition. Contracting officer's representative" means an individual designated in accordance with subsection 201.602-2 of the Defense Federal Acquisition Regulation Supplement and authorized in writing by the contracting officer to perform specific technical or administrative functions.

(b) If the Contracting Officer designates a contracting officer's representative (COR), the Contractor will receive a copy of the written designation. It will specify the extent of the COR's authority to act on behalf of the contracting officer. The COR is not authorized to make any commitments or changes that will affect price, quality, quantity, delivery, or any other term or condition of the contract.

(End of clause)

## 252.203-7001 PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE-CONTRACT-RELATED FELONIES (MAR 1999)

(a) Definitions. As used in this clause—

(1) "Arising out of a contract with the DoD" means any act in connection with—

(i) Attempting to obtain;

(ii) Obtaining, or

(iii) Performing a contract or first-tier subcontract of any agency, department, or component of the Department of Defense (DoD).

(2) "Conviction of fraud or any other felony" means any conviction for fraud or a felony in violation of state or Federal criminal statutes, whether entered on a verdict or plea, including a plea of *nolo contendere*, for which sentence has been imposed.

(3) "Date of conviction" means the date judgment was entered against the individual.

(b) Any individual who is convicted after September 29, 1988, of fraud or any other felony arising out of a contract with the DoD is prohibited from serving--

(1) In a management or supervisory capacity on any DoD contract or first-tier subcontract;

(2) On the board of directors of any DoD contractor or first-tier subcontractor;

(3) As a consultant, agent, or representative for any DoD contractor or first-tier subcontractor; or

(4) In any other capacity with the authority to influence, advise, or control the decisions of any DoD contractor or subcontractor with regard to any DoD contract or first-tier subcontract.

(c) Unless waived, the prohibition in paragraph (b) of this clause applies for not less than 5 years from the date of conviction.

(d) 10 U.S.C. 2408 provides that a defense contractor or first-tier subcontractor shall be subject to a criminal penalty of not more than \$500,000 if convicted of knowingly—

(1) Employing a person under a prohibition specified in paragraph (b) of this clause; or

- (2) Allowing such a person to serve on the board of directors of the contractor or first-tier subcontractor.
- (e) In addition to the criminal penalties contained in 10 U.S.C. 2408, the Government may consider other available remedies, such as—
  - (1) Suspension or debarment;
  - (2) Cancellation of the contract at no cost to the Government; or
  - (3) Termination of the contract for default.
- (f) The Contractor may submit written requests for waiver of the prohibition in paragraph (b) of this clause to the Contracting Officer. Requests shall clearly identify—
  - (1) The person involved;
  - (2) The nature of the conviction and resultant sentence or punishment imposed;
  - (3) The reasons for the requested waiver; and
  - (4) An explanation of why a waiver is in the interest of national security.
- (g) The Contractor agrees to include the substance of this clause, appropriately modified to reflect the identity and relationship of the parties, in all first-tier subcontracts exceeding the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation, except those for commercial items or components.
- (h) Pursuant to 10 U.S.C. 2408(c), defense contractors and subcontractors may obtain information as to whether a particular person has been convicted of fraud or any other felony arising out of a contract with the DoD by contacting The Office of Justice Programs, The Denial of Federal Benefits Office, U.S. Department of Justice, telephone (202) 616-3507.

(End of clause)

#### 252.203-7002 DISPLAY OF DOD HOTLINE POSTER (DEC 1991)

- (a) The Contractor shall display prominently in common work areas within business segments performing work under Department of Defense (DoD) contracts, DoD Hotline Posters prepared by the DoD Office of the Inspector General.
- (b) DoD Hotline Posters may be obtained from the DoD Inspector General, ATTN: Defense Hotline, 400 Army Navy Drive, Washington, DC 22202-2884.
- (c) The Contractor need not comply with paragraph (a) of this clause if it has established a mechanism, such as a hotline, by which employees may report suspected instances of improper conduct, and instructions that encourage employees to make such reports.

(End of clause)

#### 252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT (APR 1992)

The Contractor's procedures for protecting against unauthorized disclosure of information shall not require Department of Defense employees or members of the Armed Forces to relinquish control of their work products, whether classified or not, to the contractor.

(End of clause)

**252.209-7004 SUBCONTRACTING WITH FIRMS THAT ARE OWNED OR CONTROLLED BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)**

(a) Unless the Government determines that there is a compelling reason to do so, the Contractor shall not enter into any subcontract in excess of \$25,000 with a firm, or subsidiary of a firm, that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country.

(b) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country. The notice must include the name of the proposed subcontractor notwithstanding its inclusion on the List of Parties Excluded From Federal Procurement and Nonprocurement Programs.

**252.219-7003 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (DOD CONTRACTS) (APR. 1996)**

This clause supplements the Federal Acquisition Regulation 52.219-9, Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan, clause of this contract.

(a) *Definitions. Historically black colleges and universities*, as used in this clause, means institutions determined by the Secretary of Education to meet the requirements of 34 CFR 608.2. The term also means any nonprofit research institution that was an integral part of such a college or university before November 14, 1986.

*Minority institutions*, as used in this clause, means institutions meeting the requirements of section 1046(3) of the Higher Education Act of 1965 (20 U.S.C. 1135d-5(3)). The term also includes Hispanic-serving institutions as defined in section 316(b)(1) of such Act (20 U.S.C. 1059c(b)(1)).

(b) Except for company or division-wide commercial items subcontracting plans, the term *small disadvantaged business*, when used in the FAR 52.219-9 clause, includes historically black colleges and universities and minority institutions, in addition to small disadvantaged business concerns.

(c) Work under the contract or its subcontracts shall be credited toward meeting the small disadvantaged business concern goal required by paragraph (d) of the FAR 52.219-9 clause when:

(1) It is performed on Indian lands or in joint venture with an Indian tribe or a tribally-owned corporation, and

(2) It meets the requirements of 10 U.S.C. 2323a.

(d) Subcontracts awarded to workshops approved by the Committee for Purchase from People Who are Blind or Severely Disabled (41 U.S.C. 46-48), may be counted toward the Contractor's small business subcontracting goal.

(e) A mentor firm, under the Pilot Mentor-Protege Program established under Section 831 of Pub. L. 101-510, as amended, may count toward its small disadvantaged business goal, subcontracts awarded--

(f) The master plan approval referred to in paragraph (f) of the FAR 52.219-9 clause is approval by the Contractor's cognizant contract administration activity.

(g) In those subcontracting plans which specifically identify small, small disadvantaged, and women-owned small businesses, the Contractor shall notify the Administrative Contracting Officer of any substitutions of firms that are not small, small disadvantaged, or women-owned small businesses for the firms listed in the subcontracting plan.

Notifications shall be in writing and shall occur within a reasonable period of time after award of the subcontract. Contractor-specified formats shall be acceptable.

(End of clause)

#### 252.223-7004 DRUG-FREE WORK FORCE (SEP 1988)

##### (a) Definitions.

(1) "Employee in a sensitive position," as used in this clause, means an employee who has been granted access to classified information; or employees in other positions that the Contractor determines involve national security; health or safety, or functions other than the foregoing requiring a high degree of trust and confidence.

(2) "Illegal drugs," as used in this clause, means controlled substances included in Schedules I and II, as defined by section 802(6) of title 21 of the United States Code, the possession of which is unlawful under chapter 13 of that Title. The term "illegal drugs" does not mean the use of a controlled substance pursuant to a valid prescription or other uses authorized by law.

(b) The Contractor agrees to institute and maintain a program for achieving the objective of a drug-free work force. While this clause defines criteria for such a program, contractors are encouraged to implement alternative approaches comparable to the criteria in paragraph (c) that are designed to achieve the objectives of this clause.

(c) Contractor programs shall include the following, or appropriate alternatives:

(1) Employee assistance programs emphasizing high level direction, education, counseling, rehabilitation, and coordination with available community resources;

(2) Supervisory training to assist in identifying and addressing illegal drug use by Contractor employees;

(3) Provision for self-referrals as well as supervisory referrals to treatment with maximum respect for individual confidentiality consistent with safety and security issues;

(4) Provision for identifying illegal drug users, including testing on a controlled and carefully monitored basis. Employee drug testing programs shall be established taking account of the following:

(i) The Contractor shall establish a program that provides for testing for the use of illegal drugs by employees in sensitive positions. The extent of and criteria for such testing shall be determined by the Contractor based on considerations that include the nature of the work being performed under the contract, the employee's duties, and efficient use of Contractor resources, and the risks to health, safety, or national security that could result from the failure of an employee adequately to discharge his or her position.

(ii) In addition, the Contractor may establish a program for employee drug testing--

(A) When there is a reasonable suspicion that an employee uses illegal drugs; or

(B) When an employees has been involved in an accident or unsafe practice;

(C) As part of or as a follow-up to counseling or rehabilitation for illegal drug use;

(D) As part of a voluntary employee drug testing program.

(iii) The Contractor may establish a program to test applicants for employment for illegal drug use.

(iv) For the purpose of administering this clause, testing for illegal drugs may be limited to those substances for which testing is prescribed by section 2..1 of subpart B of the "Mandatory Guidelines for Federal Workplace Drug Testing Programs" (53 FR 11980 (April 11, 1988), issued by the Department of Health and Human Services.

(d) Contractors shall adopt appropriate personnel procedures to deal with employees who are found to be using drugs illegally. Contractors shall not allow any employee to remain on duty or perform in a sensitive position who is found to use illegal drugs until such times as the Contractor, in accordance with procedures established by the Contractor, determines that the employee may perform in such a position.

(e) The provisions of this clause pertaining to drug testing program shall not apply to the extent that are inconsistent with state or local law, or with an existing collective bargaining agreement; provided that with respect to the latter, the Contractor agrees those issues that are in conflict will be a subject of negotiation at the next collective bargaining session.

(End of clause)

#### 252.223-7006 PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND HAZARDOUS MATERIALS (APR 1993)

(a) "Definitions".

As used in this clause --

(1) "Storage" means a non-transitory, semi-permanent or permanent holding, placement, or leaving of material. It does not include a temporary accumulation of a limited quantity of a material used in or a waste generated or resulting from authorized activities, such as servicing, maintenance, or repair of Department of Defense (DoD) items, equipment, or facilities.

(2) "Toxic or hazardous materials" means:

(i) Materials referred to in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. 9601(14)) and materials designated under section 102 of CERCLA (42 U.S.C. 9602) (40 CFR part 302);

(ii) Materials that are of an explosive, flammable, or pyrotechnic nature; or

(iii) Materials otherwise identified by the Secretary of Defense as specified in DoD regulations.

(b) In accordance with 10 U.S.C. 2692, the Contractor is prohibited from storing or disposing of non-DoD-owned toxic or hazardous materials on a DoD installation, except to the extent authorized by a statutory exception to 10 U.S.C. 2692 or as authorized by the Secretary of Defense or his designee.

(End of clause)

#### 252.225-7031 SECONDARY ARAB BOYCOTT OF ISRAEL (JUN 1992)

(a) Definitions. As used in this clause--

(1) "Foreign person" means any person other than a United States person as defined in Section 16(2) of the Export Administration Act of 1979 (50 U.S.C. App. Sec 2415).

(2) "United States person" is defined in Section 16(2) of the Export Administration Act of 1979 and means any United States resident or national (other than an individual resident outside the United States and employed by other than a United States person), any domestic concern (including any permanent domestic establishment of any foreign

concern), and any foreign subsidiary or affiliate (including any permanent foreign establishment) of any domestic concern which is controlled in fact by such domestic concerns, as determined under regulations of the President.

(b) Certification. By submitting this offer, the Offeror, if a foreign person, company or entity, certifies that it--

(1) Does not comply with the Secondary Arab Boycott of Israel; and

(2) Is not taking or knowingly agreeing to take any action, with respect to the Secondary Boycott of Israel by Arab countries, which 50 U.S.C. App. Sec 2407(a) prohibits a United States person from taking.

(End of clause)

#### 252.227-7033 RIGHTS IN SHOP DRAWINGS (APR 1966)

(a) Shop drawings for construction means drawings, submitted to the Government by the Construction Contractor, subcontractor or any lower-tier subcontractor pursuant to a construction contract, showing in detail (i) the proposed fabrication and assembly of structural elements and (ii) the installation (i.e., form, fit, and attachment details) of materials or equipment. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(b) This clause, including this paragraph (b), shall be included in all subcontracts hereunder at any tier.

#### 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (DEC 1991)

When the allowability of costs under this contract is determined in accordance with part 31 of the Federal Acquisition Regulation (FAR), allowability shall also be determined in accordance with part 231 of the Defense FAR Supplement, in effect on the date of this contract.

#### 252.236-7000 MODIFICATION PROPOSALS - PRICE BREAKDOWN. (DEC 1991)

(a) The Contractor shall furnish a price breakdown, itemized as required and within the time specified by the Contracting Officer, with any proposal for a contract modification.

(b) The price breakdown --

(1) Must include sufficient detail to permit an analysis of profit, and of all costs for --

(i) Material;

(ii) Labor;

(iii) Equipment;

(iv) Subcontracts; and

(v) Overhead; and

(2) Must cover all work involved in the modification, whether the work was deleted, added, or changed.

(c) The Contractor shall provide similar price breakdowns to support any amounts claimed for subcontracts.

(d) The Contractor's proposal shall include a justification for any time extension proposed.

## 252.242-7000 POSTAWARD CONFERENCE (DEC 1991)

The Contractor agrees to attend any postaward conference convened by the contracting activity or contract administration office in accordance with Federal Acquisition Regulation subpart 42.5.

(End of clause)

## 252.243-7001 PRICING OF CONTRACT MODIFICATIONS (DEC 1991)

When costs are a factor in any price adjustment under this contract, the contract cost principles and procedures in FAR part 31 and DFARS part 231, in effect on the date of this contract, apply.

## 252.243-7002 REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)

(a) The amount of any request for equitable adjustment to contract terms shall accurately reflect the contract adjustment for which the Contractor believes the Government is liable. The request shall include only costs for performing the change, and shall not include any costs that already have been reimbursed or that have been separately claimed. All indirect costs included in the request shall be properly allocable to the change in accordance with applicable acquisition regulations.

(b) In accordance with 10 U.S.C. 2410(a), any request for equitable adjustment to contract terms that exceeds the simplified acquisition threshold shall bear, at the time of submission, the following certificate executed by an individual authorized to certify the request on behalf of the Contractor:

I certify that the request is made in good faith, and that the supporting data are accurate and complete to the best of my knowledge and belief.

-----  
(Official's Name)

-----  
(Title)

(c) The certification in paragraph (b) of this clause requires full disclosure of all relevant facts, including--

(1) Cost or pricing data if required in accordance with subsection 15.403-4 of the Federal Acquisition Regulation (FAR); and

(2) Information other than cost or pricing data, in accordance with subsection 15.403-3 of the FAR, including actual cost data and data to support any estimated costs, even if cost or pricing data are not required.

(d) The certification requirement in paragraph (b) of this clause does not apply to----

(1) Requests for routine contract payments; for example, requests for payment for accepted supplies and services, routine vouchers under a cost-reimbursement type contract, or progress payment invoices; or

(2) Final adjustment under an incentive provision of the contract.

## 252.248-7000 PREPARATION OF VALUE ENGINEERING CHANGE PROPOSALS (MAY 1994)

Prepare value engineering change proposals, for submission pursuant to the value engineering clause of this contract, in the format prescribed by the version of MIL-STD-973 in effect on the date of contract award.

(End of clause)



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## SPECIAL CLAUSES

### SC-1. COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984) (FAR 52.211-10).

The Contractor shall be required to (a) commence work under this Contract within 10 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 330 calendar days after date of receipt by Contractor of notice to proceed. The time stated for completion shall include final cleanup of the premises.

#### SC-1.1 OPTION FOR INCREASED QUANTITY

a. The Government may increase the quantity of work awarded by exercising Optional Items 0003, 0004, 0005, 0006, 0007, 0008, 0009, 0010, 0011, 0012, 0013 and 0014 within 120 days of the receipt by the Contractor of the notice to proceed. The notice to proceed on work Items added by exercise of the options will be given upon execution of consent of surety.

b. The parties hereto further agree that any options herein shall be considered to have been exercised at the time the Government deposits written notification to the Contractor in the mails.

c. The time allowed for completion of the optional item awarded under this contract will be the same as that for the base items, and will be measured from the date of receipt of the notice to proceed for the base items.

#### SC-1.2 EXCEPTION TO COMPLETION PERIOD

In case the Contracting Officer determines that completion of seeding, sodding, and planting, and establishment of same is not feasible within the completion period(s) stated above, the Contractor shall accomplish such work in the first planting period following the contract completion period and shall complete such work as specified, unless other planting periods are directed or approved by the Contracting Officer.

### SC-2. LIQUIDATED DAMAGES - CONSTRUCTION (APR 1984) (FAR 52.211-12)

(a) If the Contractor fails to complete the work within the time specified in the Contract, or any extension, the Contractor shall pay to the Government as liquidated damages, the sum of \$841 for each day of delay.

(b) If the Government terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned the Government in completing the work.

(c) If the Government does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

(d) Exception to Liquidated Damage: In case the Contracting Officer determines that completion of work stated above in paragraph Exception to Completion Period(s) is not feasible during the completion period(s) stated in SC-1, such work will be exempted from liquidated damages.

SC-3. DELETED.

SC-4. DELETED.

SC-5. INSURANCE - WORK ON A GOVERNMENT INSTALLATION (SEP 1989) (FAR 52.228-5)

(a) The Contractor shall, at its own expense, provide and maintain during the entire performance period of this Contract at least the kinds and minimum amounts of insurance required in the Insurance Liability Schedule or elsewhere in the Contract.

(b) Before commencing work under this Contract, the Contractor shall certify to the Contracting Officer in writing that the required insurance has been obtained. The policies evidencing required insurance shall contain an endorsement to the effect that any cancellation or any material change adversely affecting the Government's interest shall not be effective:

(1) for such period as the laws of the State in which this Contract is to be performed prescribe; or

(2) until 30 days after the insurer or the Contractor gives written notice to the Contracting Officer, whichever period is longer.

(c) The Contractor shall insert the substance of this clause, including this paragraph (c), in subcontracts under this Contract that require work on a Government installation and shall require subcontractors to provide and maintain the insurance required in the Schedule or elsewhere in the Contract. The Contractor shall maintain a copy of all subcontractors' proofs of required insurance, and shall make copies available to the Contracting Officer upon request.

(d) Insurance Liability Schedule (FAR 28.307-2)

(1) Workers' compensation and employer's liability. Contractors are required to comply with applicable Federal and State workers' compensation and occupational disease statutes. If occupational diseases are not compensable under those statutes, they shall be covered under the employer's liability section of the insurance policy, except when Contract operations are so commingled with a Contractor's commercial operation that it would not be practical to require this coverage. Employer's liability coverage of at least \$100,000 shall be required, except in states with exclusive or monopolistic funds that do not permit workers' compensation to be written by private carriers.

(2) General Liability.

(a) The Contracting Officer shall require bodily injury liability insurance coverage written on the comprehensive form of policy of at least \$500,000 per occurrence.

(b) Property damage liability insurance shall be required only in special circumstances as determined by the agency.

(3) Automobile liability. The Contracting Officer shall require automobile liability insurance written on the comprehensive form of policy. The policy shall provide for bodily injury and property damage liability covering the operation of all automobiles used in connection with performing the Contract. Policies covering automobiles operated in the United States shall provide coverage of at least \$200,000 per person and \$500,000 per occurrence for bodily injury and \$20,000 per occurrence for property damage. The amount of liability coverage on other policies shall be commensurate with any legal requirements of the locality and sufficient to meet normal and customary claims.

(4) Aircraft public and passenger liability. When aircraft are used in connection with performing the Contract, the Contracting Officer shall require aircraft public and passenger liability insurance. Coverage shall be at least \$200,000 per person and \$500,000 per occurrence for bodily injury, other than passenger liability, and \$200,000 per occurrence for property damage. Coverage for passenger liability bodily injury shall be at least \$200,000 multiplied by the number of seats or passengers, whichever is greater.

(5) Environmental Liability. If this contract includes the transport, treatment, storage, or disposal of hazardous material waste the following coverage is required.

The Contractor shall ensure the transporter and disposal facility have liability insurance in effect for claims arising out of the death or bodily injury and property damage from hazardous material/waste transport, treatment, storage and disposal, including vehicle liability and legal defense costs in the amount of \$1,000,000.00 as evidenced by a certificate of insurance for General, Automobile, and Environmental Liability Coverage. Proof of this insurance shall be provided to the Contracting Officer.

SC-6. – DELETED.

SC-7. PERFORMANCE OF WORK BY THE CONTRACTOR (APR 1984) (FAR 52.236-1): The Contractor shall perform on the site, and with its own organization, work equivalent to at least fifteen percent (15%) of the total amount of work to be performed under the Contract. The percentage may be reduced by a supplemental agreement to this Contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government.

SC-8. PHYSICAL DATA (APR 1984) (FAR 52.236-4): Data and information furnished or referred to below is for the Contractor's information. The Government will not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

(a) Physical Conditions: The indications of physical conditions on the drawings and in the specifications are the result of site investigations by test holes shown on the drawings.

(b) Weather Conditions: Each bidder shall be satisfied before submitting his bid as to the hazards likely to arise from weather conditions. Complete weather records and reports may be obtained from any National Weather Service Office.

(c) Transportation Facilities: Each bidder, before submitting his bid, shall make an investigation of the conditions of existing public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress at the jobsite. The unavailability of transportation facilities or limitations thereon shall not become a basis for claims for damages or extension of time for completion of the work.

SC-9. DELETED.

SC-10. LAYOUT OF WORK (APR 1984) (FAR 52.236-17): The Contractor shall lay out its work from Government-established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due, or to become due, to the Contractor.

SC-11. THROUGH SC-13. DELETED.

SC-14. EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995)-(EFARS 52.231-5000)

(a) This clause does not apply to terminations. See 52.249-5000, Basis for Settlement of Proposals and FAR Part 49.

(b) Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series equipment from the contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, Construction Equipment Ownership and Operating Expense Schedule, Region IV. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the Contracting Officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiations shall apply. For retroactive pricing, the schedule in effect at the time the work was performed shall apply.

(c) Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements, will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

(d) When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the contracting officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data, as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet.

(e) Copies of EP1110-1-8 "Construction Equipment Ownership and Operating Expense Schedule" Volumes 1 through 12 are available in Portable Document Format (PDF) only and can be viewed or downloaded at <http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/cecw.htm>. Copies of the CD-ROM (Volumes 1-12) are also available through either the Superintendent of Documents or Government bookstores. For additional information telephone 202-512-2250, or access on the Internet at [http://www.access.gpo.gov/su\\_docs](http://www.access.gpo.gov/su_docs).

SC-15. PAYMENT FOR MATERIALS DELIVERED OFF-SITE (MAR 1995)-(EFARS 52.232-5000)

(a) Pursuant to FAR clause 52.232-5, Payments Under Fixed Priced Construction Contracts, materials delivered to the contractor at locations other than the site of the work may be taken into consideration in making payments if included in payment estimates and if all the conditions of the General Provisions are fulfilled. Payment for items delivered to locations other than the work site will be limited to: (1) materials required by the technical provisions; or (2) materials that have been fabricated to the point where they are identifiable to an item of work required under this contract.

(b) Such payment will be made only after receipt of paid or receipted invoices or invoices with canceled check showing title to the items in the prime contractor and including the value of material and labor incorporated into the item. In addition to petroleum products, payment for materials delivered off-site is limited to the following items. Any other construction material stored offsite may be considered in determining the amount of a progress payment.

SC-16. DELETED

SC-17. DELETED.

SC-18. CONTRACT DRAWINGS, MAPS, AND SPECIFICATIONS (OCT 1996) (52.0236-4001 EBS)

(a) The Government--

(1) Will provide the Contractor, without charge, one set of contract drawings and one set of specifications in electronic format on a compact disk. The Government will not give the Contractor any hard copy paper drawings or specifications for any contract resulting from this solicitation.

(b) The Contractor shall--

(1) check all drawings furnished immediately upon receipt;

(2) Compare all drawings and verify the figures before laying out the work;

(3) Promptly notify the Contracting Officer of any discrepancies;  
and

(4) Be responsible for any errors which might have been avoided by complying with this paragraph (b).

(c) Large scale drawings shall, in general, govern small scale drawings. Figures marked on drawings shall, in general, be followed in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work, but shall be performed as if fully and correctly set forth and described in the drawings and specifications.

(e) The work shall conform to the specifications and the contract drawings identified in the index of drawings attached at the end of the Special Clauses.

SC-19. Through SC-22 DELETED.

SC-23. RECOVERED MATERIALS: The Corps of Engineers encourages all bidders to utilize recovered materials to the maximum extent practicable. The Contractor shall comply with the provisions of the Executive Order EO 13101 within the scope of his operations. The attached APPENDIX R contains procurement guidelines for products containing recovered materials. The Contractor shall fill out RECOVERED MATERIALS DETERMINATION FORM attached at the end of APPENDIX R and submit it to the Contracting Officer.

## APPENDIX R

### PART 247 - COMPREHENSIVE PROCUREMENT GUIDELINE FOR PRODUCTS CONTAINING RECOVERED MATERIALS

40 CFR Ch. 1 (9-1-99 Edition)

#### Subpart B-Item Designations

##### § 247.10 Paper and paper products.

Paper and paper products, excluding building and construction paper grades.

##### § 247.11 Vehicular products.

- (a) Lubricating oils containing re-refined oil, including engine lubricating oils, hydraulic fluids, and gear oils, excluding marine and aviation oils.
- (b) Tires, excluding airplane tire
- (e) Reclaimed engine coolants, excluding coolants used in non-vehicular applications.

##### § 247.12 Construction products.

- (a) Building insulation product including the following items:
  - (1) Loose-fill insulation, including but not limited to cellulose fiber, mineral fibers (fiberglass and rock vermiculite, and perlite;
  - (2) Blanket and batt insulation, including but not limited to mineral fibers (fiberglass and rock wool);
  - (3) Board (sheathing, roof decking wall panel) insulation, including but not limited to structural fiberboard and laminated paperboard products perlite composite board, polyurethane, polyisocyanurate, polystyrene, phenolics, and composites; and
  - (4) Spray-in-place insulation, including but not limited to foam-in-place polyurethane and polyisocyanurate and spray-on cellulose.
- (b) Structural fiberboard and laminated paperboard products for applications other than building insulation, including building board, sheathing shingle backer, sound deadening board, roof insulating board, insulating wallboard, acoustical and non-acoustical ceiling tile, acoustical and non-acoustical lay-in panels, floor underlayments, and roof overlay (coverboard).
- (c) Cement and concrete, including concrete products such as pipe and block, containing coal fly as ground granulated blast furnace (GGBF) slag.
- (d) Carpet made of polyester fiber use in low- and medium-wear applications.
- (e) Floor tiles and patio blocks containing recovered rubber or plastic.
- (f) Shower and restroom dividers/partitions containing recovered plastic or steel.
- (g) (1) Consolidated latex paint used for covering graffiti; and  
(2) Reprocessed latex paint used for interior and exterior architectural applications such as wallboard, ceilings, and trim; gutter boards; and concrete, stucco, masonry, wood and metal surfaces.

§247.13 Transportation products.

- (a) Traffic barricades and traffic cones used in controlling or restricting vehicular traffic.
- (b) Parking stops made from concrete or containing recovered plastic or rubber.
- (c) Channelizers containing recovered plastic or rubber.
- (d) Delineators containing recovered plastic, rubber, or steel.
- (e) Flexible delineators containing recovered plastic.

§ 247.14 Park and recreation products

- (a) Playground surfaces and running tracks containing recovered rubber or plastic.
- (b) Plastic fencing containing recovered plastic for use in controlling snow or sand drifting and as a warning/safety barrier in construction or other applications.

§ 247.15 Landscaping products.

- (a) Hydraulic mulch products containing recovered paper or recovered wood used for hydroseeding and as an over-spray for straw mulch in landscaping, erosion control, and soil reclamation.
- (b) Compost made from yard trimmings, leaves, and/or grass clippings for use in landscaping, seeding of grass or other plants on roadsides and embankments, as a nutritious mulch under trees and shrubs, and in erosion control and soil reclamation.
- (c) Garden and soaker hoses containing recovered plastic or rubber.
- (d) Lawn and garden edging containing recovered plastic or rubber.

§ 247.16 Non-paper office product.

- (a) Office recycling containers and office waste receptacles.
- (b) Plastic desktop accessories.
- (c) Toner cartridges.
- (d) Binders.
- (e) Plastic trash bags.
- (f) Printer ribbons.
- (g) Plastic envelopes.

§ 247.17 Miscellaneous products.

Pallets containing recovered wood, plastic, or paperboard.

## RECOVERED MATERIALS DETERMINATION FORM

### *Instructions*

This form is to be completed by the procurement originator when EPA-designated items included in the Affirmative Procurement Program for Recovered Materials are being procured from outside vendors. For questions on whether the product counts as "EPA designated" or what the required recycled content is, refer to product descriptions on EPA's website at <http://www.epa.gov/cpg>. This form is not required for items requisitioned from established Federal supply sources.

1. The procurement originator lists which item(s) apply to the procurement request, the required recycled content, the actual recycled content, and signs and dates the appropriate Certification on the back of this form.
2. If an exemption is being claimed, the procurement originator's unit commander also signs the Certification on the back of this form.
3. The completed form becomes part of the contracting office contract file.

Procurement Request No. \_\_\_\_\_

The EPA-designated items being procured are:

- ☐ Building insulation
- ☐ Flowable fill
- ☐ Latex paint
- ☐ Floor tiles
- ☐ Laminated paperboard
- ☐ Structural fiberboard
- ☐ Polyester carpet
- ☐ Carpet Backing
- ☐ Carpet Cushion
- Cement & concrete containing:
  - ☐ Coal fly ash
  - ☐ Ground granulated  
blast furnace slag
- ☐ Binders  
(paper, solid plastic or  
plastic covered)
- ☐ Plastic presentation folders
- ☐ Plastic file folders
- ☐ Plastic clip portfolios
- ☐ Plastic clipboards
- ☐ Plastic envelopes
- ☐ Office recycling containers
- ☐ Office waste receptacles
- ☐ Plastic desktop accessories

- \_\_\_ Printing and writing papers
- \_\_\_ Printer ribbons
- \_\_\_ Toner cartridges
- \_\_\_ Awards and plaques
- \_\_\_ Playground surfaces
- \_\_\_ Park and recreational furniture
- \_\_\_ Running tracks
- \_\_\_ Playground equipment
- \_\_\_ Traffic barricades
- \_\_\_ Signage
- \_\_\_ Traffic cones
- \_\_\_ Channelizers
- \_\_\_ Delineators
- \_\_\_ Flexible delineators
- \_\_\_ Parking stops
- \_\_\_ Plastic fencing (snow or erosion control, safety barriers)
- \_\_\_ Engine coolants
- \_\_\_ Re-refined lubricating oils
- \_\_\_ Retread tires
- \_\_\_ Garden and soaker hoses
- \_\_\_ Lawn and garden edging
- \_\_\_ Patio blocks
- \_\_\_ Landscaping timbers and posts (plastic lumber)
- \_\_\_ Compost from yard trimmings or food waste
- \_\_\_ Commercial/industrial sanitary tissue products
- \_\_\_ Sorbents
- \_\_\_ Industrial Drums
- \_\_\_ Railroad grade crossings/surfaces
- \_\_\_ Pallets
- \_\_\_ Paperboard and packaging
- \_\_\_ Strapping and stretch wrap
- \_\_\_ Shower & restroom dividers/partitions
- \_\_\_ Plastic trash bags
- \_\_\_ Mats
- \_\_\_ Hydraulic mulch
- \_\_\_ Tray liners
- \_\_\_ Newsprint

CERTIFICATION

Procurement Request No. \_\_\_\_\_

Complete Part A or Part B as appropriate:

\*\*\*\*\*

A. I hereby certify the Statement of Work/Specifications for the requisition of all materials listed on this form complies with EPA standards for recycled/recovered materials content.

\_\_\_\_\_  
Procurement Originator's Signature

\_\_\_\_\_  
Date

\*\*\*\*\*

B. The following item does not comply with EPA standards for recycled/recovered materials *(please complete a separate justification for each noncompliant item purchased as part of this procurement action)*: \_\_\_\_\_

The exemption being claimed for this purchase is:

\_\_\_ The product does not meet appropriate performance standards

\_\_\_ The product is not available within a reasonable time frame

\_\_\_ The product is not available competitively (from two or more sources)

\_\_\_ The product is only available at an unreasonable price (it costs more than a comparable non-recycled-content product). The recycled-content product costs \$\_\_\_\_\_ per \_\_\_\_\_ and the non-recycled-content product costs \$\_\_\_\_\_ per \_\_\_\_\_

\_\_\_\_\_  
Procurement Originator

\_\_\_\_\_  
Date

\_\_\_\_\_  
Commander

\_\_\_\_\_  
Date

INDEX OF DRAWINGS

IMPROVE CAPEHART HOUSING, PHASE 3  
 MALMSTROM AFB, MONTANA  
 NZAS 8600017  
 227s/711-20-01

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30	A5.2	EXTERIOR ELEVATIONS (UNIT B1)		30 NOV 01
31	A5.3	EXTERIOR ELEVATIONS (UNIT B2)		30 NOV 01
32	A5.4	EXTERIOR ELEVATIONS (UNIT B3)		30 NOV 01
33	A6.1	BUILDING SECTIONS		30 NOV 01
34	A6.2	WALL SECTIONS AND DETAILS		30 NOV 01
35	A6.3	WALL SECTIONS AND DETAILS		30 NOV 01
36	A7.1	KITCHEN INTERIOR ELEVATIONS		30 NOV 01
37	A7.2	BATHROOM INTERIOR ELEVATIONS		30 NOV 01
38	A8.1	DETAILS		30 NOV 01
39	A8.2	DETAILS		30 NOV 01

<b>SHEET NUMBER</b>	<b>PLATE NUMBER</b>	<b>TITLE</b>	<b>REVISION NUMBER</b>	<b>DATE</b>
40	S1.1	STRUCTURAL GENERAL NOTES		30 NOV 01
41	S1.2	STRUCTURAL PHASE NUMBER KEY PLAN		30 NOV 01
42	S2.1	STRUCTURAL FRAMING PLAN A3		30 NOV 01
43	S2.2	STRUCTURAL FRAMING PLAN B1		30 NOV 01
44	S2.3	STRUCTURAL FRAMING PLAN B2		30 NOV 01
45	S2.4	STRUCTURAL FRAMING PLAN B3		30 NOV 01
46	S3.1	STRUCTURAL SECTIONS		30 NOV 01
47	S3.2	STRUCTURAL SECTIONS		30 NOV 01
47a	S4.2	STRUCTURAL TYPICAL FOUNDATION SECTIONS		30 NOV 01
48	M1.1	MECHANICAL LEGEND, SYMBOLS, ABBREV., GENERAL NOTES		30 NOV 01
49	M1.2	MECHANICAL SCHEDULES		30 NOV 01
50	M2.1	MECHANICAL PLAN UNIT A3		30 NOV 01
51	M2.2	PLUMBING / PIPING PLANS UNIT A3		30 NOV 01
52	M2.3	MECHANICAL PLAN UNIT B1		30 NOV 01
53	M2.4	PLUMBING / PIPING PLANS UNIT B1		30 NOV 01
54	M2.5	MECHANICAL PLAN UNIT B2		30 NOV 01
55	M2.6	PLUMBING / PIPING PLANS UNIT B2		30 NOV 01
56	M2.7	MECHANICAL PLAN UNIT B3		30 NOV 01
57	M2.8	PLUMBING / PIPING PLANS UNIT B3		30 NOV 01
58	M3.1	MECHANICAL SECTIONS AND DETAILS		30 NOV 01
59	E1.1	SITE ELECTRICAL DEMOLITION		30 NOV 01
60	E1.2	SITE ELECTRICAL CONSTRUCTION		30 NOV 01

SHEET NUMBER	PLATE NUMBER	TITLE	REVISION NUMBER	DATE
61	E2.1	ELECTRICAL PLAN UNIT A3		30 NOV 01
62	E2.2	ELECTRICAL PLAN UNIT B1		30 NOV 01
63	E2.3	ELECTRICAL PLAN UNIT B2		30 NOV 01
64	E2.4	ELECTRICAL PLAN UNIT B3		30 NOV 01
65	E3.1	ELECTRICAL DETAILS, NOTES AND SCHEDULE		30 NOV 01
66	E3.2	ELECTRICAL DETAILS, NOTES AND SCHEDULE		30 NOV 01
67	E3.3	ELECTRICAL DETAILS, NOTES AND SCHEDULE		30 NOV 01
68	E4.1	ELECTRICAL ONE-LINE DIAGRAM		30 NOV 01

#### REVISIONS TO DRAWINGS BY NOTATION

Drawing, Sheet 67, Plate E3.3: Make the following changes to Detail 9:

1. Change "Bond ductbank ground conductor to grounding lugs" to read "Bond multi-grounded neutral conductor to grounding lug" (two places).
2. Change "Grounded/static neutral in ductbank" to read "Multi-grounded neutral in ductbank" (three places).
3. Change "Ductbank ground conductor bonded to rebar" to read "Bond rebar to ground conductor."
4. Change "Bond neutral conductor to grounding lug" to read "Bond multi-grounded neutral conductor to grounding lug."

STANDARD DETAILS BOUND IN THE SPECIFICATIONS

DRAWING NUMBER	SHEET NUMBER	TITLE	DATE
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SECTION 01501 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

1 & 2	U.S. Air Force Project Construction Sign	84JUN20
1	Hard Hat Sign	10SEP90

END OF SECTION


# DESIGN AUTHENTICATION

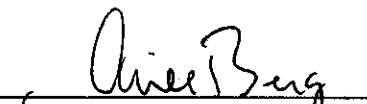
## IMPROVE CAPEHART HOUSING PROJECT, PHASE 3 MALMSTROM AFB, MONTANA


Signatures affixed below indicate the drawings and specifications included in this solicitation were prepared, reviewed and certified in accordance with Department of Army Engineer Regulation ER 1110-345-100, DESIGN POLICY FOR MILITARY CONSTRUCTION.


(Signed Drawings on File)

Jose Bazan, Bazan & Associates, Architects

  
James Nakamoto  
COE Project Manager

  
Dean M. Schmidt, Chief  
Tech. Eng. & Review Section,  
Construction Branch

  
Mark A. Ohlstrom, P.E.  
Chief, Design Branch

  
Rick L. Moshier, P.E.  
Chief, Engineering & Construction Division

This project was designed for the U.S. Army Corps of Engineers, Seattle District. The initials and/or signatures and registration designations of individuals appearing on these project documents are as required by ER 1110-1-8152, ENGINEERING AND DESIGN PROFESSIONAL REGISTRATION.

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GENERAL DECISION MT010026 03/02/2001 MT26

Date: March 2, 2001

General Decision Number MT010026

Superseded General Decision No. MT000026

State: Montana

Construction Type:  
RESIDENTIAL

County(ies):  
CASCADE

RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories)

Modification Number	Publication Date
0	03/02/2001

COUNTY(ies):  
CASCADE

SUMT4033A 03/24/1992

	Rates	Fringes
BRICKLAYERS	17.00	2.70
CARPENTERS	13.15	3.31
CEMENT MASONS	12.30	1.00
ELECTRICIANS	15.90	3.5%+1.45
IRONWORKERS	17.18	6.18
LABORERS:		
Unskilled	10.50	1.75
Pipelayer	10.66	1.75
Hod Carrier		
PAINTERS:		
Brush	12.42	1%+1.09
Spray	14.67	1%+1.09
PLUMBERS	16.20	2.17
ROOFERS	11.40	1.20
SHEET METAL WORKERS	15.19	1.82
SOFT FLOOR LAYERS	12.50	
SPRINKLER FITTERS	14.81	2.43
TERRAZZO & TILE SETTERS	14.45	1.45
TRUCK DRIVERS:		
Pickup	10.95	1.66
Flatbed:		
3 tons & under	11.00	1.66
over 3 tons	11.20	1.66
Combination truck, concrete mixer, transit mixer	11.10	1.66

-----  
WELDERS - Receive rate prescribed for craft performing operation

to which welding is incidental.

=====

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(v)).

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In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U. S. Department of Labor  
200 Constitution Avenue, N. W.  
Washington, D. C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N. W.  
Washington, D. C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment

data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U. S. Department of Labor  
200 Constitution Avenue, N. W.  
Washington, D. C. 20210

4.) All decisions by the Administrative Review Board are final.  
END OF GENERAL DECISION

DACA67-02-R-0204 MT010026-3

DACA67-02-R-0204 MT010026-3

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02009/DJ

Improve Capehart Family Housing, Phase 3, Malmstrom AFB, Montana

APPENDIX A: INSPECTION REPORT OF ASBESTOS AND LEAD-BASED  
PAINTED BUILDING MATERIALS – CAPEHART FAMILY HOUSING  
IMPROVEMENTS, PHASE 3.

## SECTION 01001

### SUPPLEMENTARY REQUIREMENTS

#### PART 1 GENERAL

##### 1.1 DEFINITIONS

The references listed below are to be defined as indicated wherever they may be used in the TECHNICAL SPECIFICATIONS.

"SUPPLEMENTARY REQUIREMENTS " shall be read to pertain to any of the sections of the DIVISION 1 as required by the content of the section or paragraph containing the reference.

Specification "SECTION 01300 – SUBMITTALS" shall be read as a specification "SECTION 01330 – SUBMITTAL PROCEDURES".

Specification "SECTION 01400 – CONTRACTOR QUALITY CONTROL" shall be read as a specification "SECTION 01451 – CONTRACTOR QUALITY CONTROL".

##### 1.2 CONSTRUCTION SCHEDULING

The instructions for preparation and submittal of the Contractor-prepared Network Analysis System are found in SECTION 01320, PROJECT SCHEDULE.

##### 1.3 CORRESPONDENCE

1.3.1 All correspondence shall be addressed to the Contracting Officer, shall be serially numbered commencing with Number 1, with no numbers missing or duplicated and shall be forwarded in quintuplicate, as directed by the authorized representative of the Contracting Officer, and shall include an additional copy forwarded to a separate designated location. All copies provided shall be legible. Enclosures attached or transmitted with the correspondence shall also be furnished with the original and each copy. Each serial letter shall make reference to the contract name, contract number and shall have only one subject.

1.3.2 For submission of Contractor payment requests, See Section 01025 – MEASUREMENT AND PAYMENT.

##### 1.4 ADVANCED NOTICE OF CONTRACTOR PERFORMED ACCEPTANCE TESTING

The Contractor shall notify the Contracting Officer a minimum of 20 days prior to performing any acceptance or "buy off" testing of the following systems: (1) Fire Detection/Protection, and (2) HVAC. Advance notification is not required for testing performed as part of fabrication or installation.

##### 1.5 CONTRACTOR'S FILES

Contractor shall maintain "Approved (Action Code "A") and "Approved Except as Noted (Action Code "B") shop drawing files in fabrication shops and at project sites for government use.

## 1.6 IDENTIFICATION OF EMPLOYEES AND MILITARY REGULATIONS:

(a) The Contractor shall be responsible for compliance with all regulations and orders of the Commanding Officer of the Military Installation, respecting identification of employees, movements on installation, parking, truck entry, and all other military regulations which may affect the work.

(b) The work under this Contract is to be performed at an operating Military Installation with consequent restrictions on entry and movement of nonmilitary personnel and equipment.

## 1.7 SPECIAL SAFETY REQUIREMENTS:

All construction activities shall be conducted in strict compliance with the Corps of Engineers Safety and Health Requirements Manual EM 385-1-1, and Occupational Safety and Health Administration regulations, as applicable.

1.7.1 In addition to Safety and Health Requirements Manual EM 385-1-1, and all applicable OSHA standards, the Contractor shall comply with the requirements listed below. Paragraph numbers refer to EM 385-1-1 or are added thereto.

(a) Paragraph 01.A.12: Add new paragraph: Safety Personnel. The Contractor shall designate a person on his staff to manage the Contractor's safety and accident prevention program. This person will provide a point of contact for the Contracting Officer on matters of job safety, and shall be responsible for ensuring the health and safety of on site personnel.

(b) Paragraph 01.D.02, revise as follows:

(1) Replace paragraph 01.D.02c with the following:  
"c. Property damage in excess of \$2,000.00

(2) Add new paragraph d as follows:  
"An injury resulting in a lost workday, not including the day of injury."

## 1.8 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (ER 415-1-15 31 OCT 89)

This Paragraph specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the CONTRACT CLAUSE entitled "Default (Fixed Price Construction)". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

1.8.1 The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

1.8.2 The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

1.8.3 The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY  
WORK DAYS BASED ON (5) DAY WORK WEEK

<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>
19	15	16	10	4	4	2	2	3	6	13	17

1.8.4 Upon acknowledgment of the notice to proceed (NTP) and continuing throughout the contract, the contractor will record on the daily QCQ report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delays must prevent work on critical activities for 50 percent or more of the contractor's scheduled work day.

1.8.5 The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph 1.8.3, above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled " Default (Fixed Price Construction)".

## 1.9 COLOR BOARDS

Two sets of color boards shall be submitted within 60 calendar days after receipt of Notice to Proceed. The board shall include samples of colors and finishes of every finish such as on walls, floors, and ceilings. This would include, but not be limited to, paint, floor and wall tile, acoustical panels, carpet, wall base, plastic laminate, etc. Where special finishes such as architectural concrete or prefinished metal panels are required, samples of not less than 305 mm (12 inches) square shall be submitted with the board. Boards shall include, where applicable, color samples of integrally colored block, brick, and prefinished metal roofing and siding. The board shall be 610 mm by 610 mm (24 inches by 24 inches). If more space is needed, more than one board per set may be submitted. This is not meant to replace the samples called for in other portions of the specifications. The Contractor shall certify that he has reviewed the color boards in detail and that they are in strict accordance with the contract drawings and specifications, except as may be otherwise explicitly stated.

## 1.10 COMPLIANCE WITH DAVIS-BACON ACT

### 1.10.1 Contractor POC

Within 14 days after award of the contract, the Contractor shall designate a point of contact (POC) within their organization who will be responsible for the Davis-Bacon Act Labor Program for the Contractor and all subcontractors under this contract as required by the Contract Clauses and FAR 52.222.

### 1.10.2 Responsibilities

The designated Contractor POC shall be responsible for Davis-Bacon Act Labor Program activities including, but not limited to:

- Documentation and record keeping
- Submittal and accuracy of certified payrolls
- Submittal of required labor forms including requests for additional classifications and rates, Statements and Acknowledgement, etc.
- Posting of the wage determination, approved additional classifications and rates, labor and EEO posters
- Coordination with the Contracting Officer's Labor Program POC

Prior to submittal to the Government, payrolls shall be reviewed for compliance to all applicable labor standards, to include, but not be limited to the following items: correct wage rates, correct overtime classification and pay, misclassification of workers for work actually performed, apprentice to journeyman ratios, and registration of apprentice. Corrective actions shall be taken as necessary to ensure Contractor compliance with applicable contract and FAR clauses.

### 1.10.3 Certification

The Contractor POC shall provide a signed certification stating the following: "I certify that the submitted items being forwarded have been reviewed in detail and are correct and in strict conformance with the Labor Standards of the contract except as otherwise stated."

PARTS 2 AND 3 NOT USED

END OF SECTION

## SECTION 01005

### SITE SPECIFIC SUPPLEMENTARY REQUIREMENTS

#### 1. CONDUCT OF WORK:

##### 1.1 COORDINATION AND ACCESS TO SITE

1.1.1 Coordination with using agencies shall be made through the Contracting Officer to assist the Contractor in completing the work with a minimum of interference and inconvenience.

1.1.2 Work hours in the construction area will be restricted to 7:45 a.m. to 4:15 p.m. daily, Monday through Friday, excluding holidays. Work hours other than as specified above shall be coordinated with and approved by the Contracting Officer.

##### 1.2 FIRE REGULATIONS

Contractor shall comply with base fire regulations and NFPA 241 Building Construction and Demolition requirements. Contractor shall provide adequate fire extinguishers for the construction site and remove them upon acceptance of the facility.

##### 1.3 GENERAL AREA REQUIREMENTS

Security requirements and procedures shall be coordinated with the 341 Security Forces Squadron, Resource Protection (telephone 406-731-4344), Malmstrom AFB. Activities of the Contractor and Contractor's employees and subcontractors and their employees while on the base, will be conducted in accordance with base regulations, including those of the fire marshal, as well as security directives. This includes, but is not limited to, obtaining a Work Clearance Request (AF Form 103) before any digging and giving way to alert vehicles during alerts if located on a marked alert route.

##### 1.3.1 Identification Credentials

All Contractor personnel, except those not under the Contractor's direct control such as concrete trucks and material deliveries, will be required to process in and obtain an Application for Civilian Identification Card (DD Form 1172) from the Corps of Engineers Malmstrom AFB Project Office in Building 1085. The Contractor shall provide the employee with a letter or form, identifying the employee and company name. After completion of the DD Form 1172, proceed to the Pass and ID Section at the Visitor Control Center in Building 192 (working hours - Monday through Friday - 7:30 a.m. to 4:30 p.m.) to obtain a base personnel access pass and vehicle pass. Current vehicle registration and proof of insurance are required for vehicle passes. The Contractor shall notify the Pass and ID Section of all losses of passes, within 48 hours after the loss, by name and address. Employees who have terminated employment or who have been dismissed must surrender their personnel and vehicle passes to the Visitors Control Center through the Contracting Officer. Employees without a personnel or vehicle pass in their possession will be denied access to the base and work areas and may be subject to detainment until proper identification is made. The passes shall not be worn or displayed off the military base.

1.3.2 Commercial or company vehicles will be allowed access to the base provided company emblems are attached to the sides of the vehicles.

1.3.3 Equipment and storage areas: See specification Section 01501 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS.

#### 1.4 CONSTRUCTION SITE FENCE

Not used.

#### 1.5 MOTORIZED EQUIPMENT

##### 1.5.1 Truck Load Limits

Truck load limits on base are restricted to:

- a. 1 April - 1 June: 350 pounds per inch width of tire.
- b. All other times: 400 pounds per inch width of tire.

##### 1.5.2 Fire Extinguishers

Motorized equipment shall be equipped with fire extinguishers as follows:

- a. Pickup truck or other light passenger vehicles, one extinguisher per vehicle, rating 5 BC.
- b. All other trucks and heavy motorized equipment, two extinguishers per vehicle, rating 10 BC.

#### 1.6 UTILITY OUTAGES

Contractor shall schedule and coordinate unavoidable utility outages with the Contracting Officer and Base Civil Engineer at least 10 days in advance. Unless indicated otherwise, the Contractor shall give 14 days preliminary notice of future outage. Final notice shall be given 10 calendar days before outage and shall specify date and time of the outage. The 'Utility Outage Notice' shall be completed by the Contractor and submitted to the Contracting Officer for approval. No interruptions shall be made until the approved Notice is returned to the Contractor. Outage durations shall be kept to a minimum. All outages longer than 2 hours shall be after normal duty hours or on a weekend at the Government option. Outages in dormitories or housing units shall be performed during business hours to minimize disruption to occupants. All outages that affect heating system motors or controls during heating season shall require the Contractor to connect backup power during the outage, as requested by the Government.

#### 1.7 PROTECTION OF GOVERNMENT PROPERTY

In addition to requirements of the CONTRACT CLAUSES, Contractor shall protect all Government property within the buildings in which he is working, except for such property as is required to be demolished. Property which is to be demolished shall be protected until its scheduled demolition time. Protection shall include, but not be limited to, protection from construction generated dust, debris, water, and vibration.

## 1.8 COORDINATION OF WORK

The Contractor shall arrange its work schedule in such a way to provide for two-way access to the housing area at all times. The Contractor shall be responsible for coordinating lane closures with on-base emergency response personnel (Base Fire Department , Law Enforcement and ambulance services), city and county emergency response personnel, trash collection contractor and school bus operators. The work schedule in writing shall be submitted for Contracting Officer's approval at least 14 days before start of work.

PART 2. NOT USED.

END OF SECTION

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## SECTION 01025

### PAYMENT

#### PART 1 GENERAL

##### 1.1 GENERAL

The contract price for each item shall constitute full compensation for furnishing all plant, labor, materials, appurtenances, and incidentals and performing all operations necessary to design, construct and complete the items in accordance with the contract documents. Payment for each item shall be considered as full compensation, notwithstanding that minor features may not be mentioned therein. Work paid for under one item will not be paid for under any other item. No separate payment will be made for the work, services, or operations required by the Contractor, as specified in DIVISION 1, GENERAL REQUIREMENTS, to complete the project in accordance with the contract documents; all costs thereof shall be considered as incidental to the work.

##### 1.2 PROGRESS PAYMENT INVOICE

Requests for payment shall be submitted in accordance with Federal Acquisition Regulations (FAR) Subpart 32.9, entitled "PROMPT PAYMENT", and Paragraphs 52.232-5 and 52.232-27, entitled "Payments Under Fixed-Price Construction Contracts", and "Prompt Payment for Construction Contracts", respectively. In addition each request shall be submitted in the number of copies and to the designated billing office as shown in the Contract.

1.2.1 When submitting payment requests, the Contractor shall complete Blocks 1 through 12 of the "PROGRESS PAYMENT INVOICE" Form as directed by the Contracting Officer. (A sample form is attached at the end of this Technical Specification Section.) The completed form shall then become the cover document to which all other support data shall be attached.

1.2.2 One additional copy of the entire request for payment, to include the "PROGRESS PAYMENT INVOICE" cover document, shall be forwarded to a separate address as designated by the Contracting Officer.

1.2.3 The Contractor shall submit with each pay request, a list of subcontractors that have worked during that pay period. The listing shall be broken down into weeks, identifying each subcontractor that has worked during a particular week, and indicate the total number of employees that have worked on site for each subcontractor for each week. The prime Contractor shall also indicate the total number of employees for its on site staff for each week.

#### PARTS 2 and 3 NOT USED

**PROGRESS PAYMENT INVOICE**

See Federal Acquisition Regulations (FAR) 32.900, 52.232-5, &amp; 52.232-27

1. PROJECT AND LOCATION	2. DATE
3. CONTRACTOR NAME AND ADDRESS (Must be the same as in the Contract)	4. CONTRACT NO.  5. INVOICE NO.
6. DESCRIPTION OF WORK	7. PERIOD OF PERFORMANCE  From:  To:
8. DISCOUNT TERMS	
9. OFFICIAL TO WHOM PAYMENT IS TO BE FORWARDED Name: Title: Phone: ( ) -	10. OFFICIAL TO BE NOTIFIED OF DEFECTIVE INVOICE Name: Title: Phone ( ) -
<b>11. CERTIFICATION: I hereby certify, to the best of my knowledge and belief, that</b> (1) The amounts requested are only for the performance in accordance with the specifications, terms, and conditions of this contract; (2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements and the requirements of Chapter 39 of Title 31, United States Code; and (3) This request for progress payment does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract.	
<div style="display: flex; justify-content: space-between; border-top: 1px solid black; margin-top: 20px;"> <span>(Signature)</span> <span>(Title)</span> <span>(Date)</span> </div>	
12. OTHER INFORMATION OR DOCUMENTATION required by Contract. Provide two (2) copies of each (check and attach if applicable):  <input type="checkbox"/> Updated Progress Chart/Schedule <input type="checkbox"/> Progress Narrative <input type="checkbox"/> Certified Payrolls (submitted weekly) <input type="checkbox"/> Safety Exposure Report <input type="checkbox"/> Updated Submittal Register <input type="checkbox"/> Progress Photos <input type="checkbox"/> Subcontractor/Employee Listings	(FOR GOVERNMENT USE ONLY)  Retainage: ____%    Amt: \$_____  Withholdings: \$_____  Reason: _____  Following items are current: As-Builts <input type="checkbox"/> Yes <input type="checkbox"/> No O & M Manuals <input type="checkbox"/> Yes <input type="checkbox"/> No 1354 Data <input type="checkbox"/> Yes <input type="checkbox"/> No Submittal Register <input type="checkbox"/> Yes <input type="checkbox"/> No

END OF SECTION

SECTION 01035

MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 PROPOSED PROJECT MODIFICATIONS:

Price proposals for proposed modifications shall be submitted in accordance with the requirements of the Contract Clause MODIFICATION PROPOSALS - PRICE BREAKDOWNS. If change order work impacts or delays other unchanged contract work, the costs of such impacts or delays shall be included in the proposals and separately identified. Additional instructions for submitting price proposals can be found in NPSP-415-1-1, INSTRUCTION AND INFORMATION FOR CONTRACTORS, a copy of which will be furnished to the Contractor at the Pre-construction Conference. For information applicable to equipment rates used in contract modifications, refer to 00800 - SPECIAL CLAUSES, clause "EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE".

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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## SECTION 01312

## QUALITY CONTROL SYSTEM (QCS)

## 1.1 GENERAL

The Government will use the Resident Management System for Windows (RMS) to assist in its monitoring and administration of this contract. The Contractor shall use the Government-furnished Construction Contractor Module of RMS, referred to as QCS, to record, maintain, and submit various information throughout the contract period. This joint Government-Contractor use of RMS and QCS will facilitate electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

- Administration
- Finances
- Quality Control
- Submittal Monitoring
- Scheduling
- Import/Export of Data

## 1.1.1 Correspondence and Electronic Communications

For ease and speed of communications, both Government and Contractor will, to the maximum extent feasible, exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record shall also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

## 1.1.2 Other Factors

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01320, PROJECT SCHEDULE, Section 01330, SUBMITTAL PROCEDURES, and Section 01451, CONTRACTOR QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through QCS. Also, there is no separate payment for establishing and maintaining the QCS database; all costs associated therewith shall be included in the contract pricing for the work.

## 1.2 QCS SOFTWARE

QCS is a Windows-based program that can be run on a stand-alone personal computer or on a network. The Government will make available the QCS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor shall be responsible to download, install and use the latest version of the QCS software from the Government's RMS Internet Website. Upon specific justification and request by the Contractor, the Government can provide QCS on (3-1/2 inch) high-density diskettes or CD-ROM. Any program updates of QCS will be made available to the Contractor via the Government RMS Website as they become available.

### 1.3 SYSTEM REQUIREMENTS

The following listed hardware and software is the minimum system configuration that the Contractor shall have to run QCS:

#### **Hardware**

- IBM-compatible PC with 200 MHz Pentium or higher processor
- 32+ MB RAM
- 4 GB hard drive disk space for sole use by the QCS system
- 3 1/2 inch high-density floppy drive
- Compact disk (CD) Reader
- Color monitor
- Laser printer compatible with HP LaserJet III or better, with minimum 4 MB installed memory.
- Connection to the Internet, minimum 28 BPS

#### **Software**

- MS Windows 95 or newer version operating system (MS Windows NT 4.0 or newer is recommended)
- Word Processing software compatible with MS Word 97 or newer
- Internet browser
- The Contractor's computer system shall be protected by virus protection software that is regularly upgraded with all issued manufacturer's updates throughout the life of the contract.
- Electronic mail (E-mail) compatible with MS Outlook

### 1.4 RELATED INFORMATION

#### 1.4.1 QCS User Guide

After contract award, the Contractor shall download instructions for the installation and use of QCS from the Government RMS Internet Website; the Contractor can obtain the current address from the Government. In case of justifiable difficulties, the Government will provide the Contractor with a CD-ROM containing these instructions.

#### 1.4.2 Contractor Quality Control(CQC) Training

The use of QCS will be discussed with the Contractor's QC System Manager during the mandatory CQC Training class.

### 1.5 CONTRACT DATABASE

Prior to the pre-construction conference, the Government shall provide the Contractor with basic contract award data to use for QCS. The Government will provide data updates to the Contractor as needed, generally by files attached to E-mail. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

### 1.6 DATABASE MAINTENANCE

The Contractor shall establish, maintain, and update data for the contract in the QCS database throughout the duration of the contract. The Contractor shall establish and maintain the QCS database at the Contractor's site office. Data updates to the Government shall be submitted by E-mail with file attachments, e.g., daily reports, schedule updates, payment requests. If permitted by the Contracting Officer, a data diskette or CD-ROM may be used instead of E-mail (see Paragraph DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM). The QCS database typically shall include current data on the following items:

#### 1.6.1 Administration

##### 1.6.1.1 Contractor Information

The database shall contain the Contractor's name, address, telephone numbers, management staff, and other required items. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver Contractor administrative data in electronic format via E-mail.

##### 1.6.1.2 Subcontractor Information

The database shall contain the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Each subcontractor/trade shall be assigned a unique Responsibility Code, provided in QCS. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver subcontractor administrative data in electronic format via E-mail.

##### 1.6.1.3 Correspondence

All Contractor correspondence to the Government shall be identified with a serial number. Correspondence initiated by the Contractor's site office shall be prefixed with "S". Letters initiated by the Contractor's home (main) office shall be prefixed with "H". Letters shall be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

#### 1.6.1.5 Equipment

The Contractor's QCS database shall contain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

#### 1.6.1.7 Management Reporting

QCS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of QCS. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Inspection checklists.

### 1.6.2 Finances

#### 1.6.2.1 Pay Activity Data

The QCS database shall include a list of pay activities that the Contractor shall develop in conjunction with the construction schedule. The sum of all pay activities shall be equal to the total contract amount, including modifications. Pay activities shall be grouped by Contract Line Item Number (CLIN), and the sum of the activities shall equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

#### 1.6.2.2 Payment Requests

All progress payment requests shall be prepared using QCS. The Contractor shall complete the payment request worksheet and include it with the payment request. The work completed under the contract, measured as percent or as specific quantities, shall be updated at least monthly. After the update, the Contractor shall generate a payment request report using QCS. The Contractor shall submit the payment requests with supporting data by E-mail with file attachment(s). If permitted by the Contracting Officer, a data diskette may be used instead of E-mail. A signed paper copy of the approved payment request is also required, which shall govern in the event of discrepancy with the electronic version.

### 1.6.3 Quality Control (QC)

QCS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other contractor QC requirements. The Contractor shall maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report. The Contractor shall provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01451, CONTRACTOR QUALITY CONTROL. Within seven calendar days of Government acceptance, the Contractor shall submit a data diskette or CD-ROM reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

#### 1.6.3.1 Daily Contractor Quality Control (CQC) Reports.

QCS includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by QCS shall be

the Contractor's official report. Data from any supplemental reports by the Contractor shall be summarized and consolidated onto the QCS-generated Daily CQC Report. Daily CQC Reports shall be submitted as required by Section 01451, CONTRACTOR QUALITY CONTROL. Reports shall be submitted electronically to the Government using E-mail or diskette within 24 hours after the date covered by the report. Use of either mode of submittal shall be coordinated with the Government representative. The Contractor shall also provide the Government a signed, printed copy of the daily CQC report.

#### 1.6.3.2 Deficiency Tracking.

The Contractor shall use QCS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC punch list items. The Contractor shall maintain a current log of its QC punch list items in the QCS database. The Government will log the deficiencies it has identified using its QA punch list items. The Government's QA punch list items will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of both QC and QA punch list items.

#### 1.6.3.3 Three-Phase Control Meetings

The Contractor shall maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

#### 1.6.3.4 Accident/Safety Tracking.

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of the safety comments. In addition, the Contractor shall utilize QCS to advise the Government of any accidents occurring on the jobsite. This brief supplemental entry is not to be considered as a substitute for completion of mandatory reports, e.g., ENG Form 3394 and OSHA Form 200.

#### 1.6.3.5 Features of Work

The Contractor shall include a complete list of the features of work in the QCS database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

#### 1.6.3.6 QC Requirements

The Contractor shall develop and maintain a complete list of QC testing, transferred and installed property, and user training requirements in QCS. The Contractor shall update all data on these QC requirements as work progresses, and shall promptly provide this information to the Government via QCS.

#### 1.6.4 Submittal Management

The Contractor will input the initial submittal register, ENG Form 4288, SUBMITTAL REGISTER, using QCS. Thereafter, the Contractor shall maintain a complete list of all submittals, including completion of all data columns. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The

Contractor shall use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update, ENG Form 4288, shall be produced using QCS. RMS will be used to update, store and exchange submittal registers and transmittals, but will not be used for storage of actual submittals.

#### 1.6.5 Schedule

The Contractor shall develop a construction schedule consisting of pay activities, in accordance with Contract Clause "Schedules for Construction Contracts", or Section 01320, PROJECT SCHEDULE, as applicable. This schedule shall be input and maintained in the QCS database either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01320, PROJECT SCHEDULE). The updated schedule data shall be included with each pay request submitted by the Contractor.

#### 1.6.6 Import/Export of Data

QCS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data, and schedule data using SDEF.

### 1.7 IMPLEMENTATION

Contractor use of QCS as described in the preceding paragraphs is mandatory. The Contractor shall ensure that sufficient resources are available to maintain its QCS database, and to provide the Government with regular database updates. QCS shall be an integral part of the Contractor's management of quality control.

#### 1.8 DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM

The Government-preferred method for Contractor's submission of updates, payment requests, correspondence and other data is by E-mail with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of computer diskettes or CD-ROM for data transfer. Data on the disks or CDs shall be exported using the QCS built-in export function. If used, diskettes and CD-ROMs will be submitted in accordance with the following:

##### 1.8.1 File Medium

The Contractor shall submit required data on 3-1/2 inch double-sided high-density diskettes formatted to hold 1.44 MB of data, capable of running under Microsoft Windows 95 or newer. Alternatively, CD-ROMs may be used. They shall conform to industry standards used in the United States. All data shall be provided in English.

##### 1.8.2 Disk or CD-ROM Labels

The Contractor shall affix a permanent exterior label to each diskette and CD-ROM submitted. The label shall indicate in English, the QCS file name, full contract number, contract name, project location, data date, name and telephone number of person responsible for the data.

##### 1.8.3 File Names

The Government will provide the file names to be used by the Contractor with the QCS software.

## 1.9 MONTHLY COORDINATION MEETING

The Contractor shall update the QCS database each workday. At least monthly, the Contractor shall generate and submit an export file to the Government with schedule update and progress payment request. As required in Contract Clause "Payments", at least one week prior to submittal, the Contractor shall meet with the Government representative to review the planned progress payment data submission for errors and omissions. The Contractor shall make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The Government will not process progress payments until an acceptable QCS export file is received.

## 1.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification.

END OF SECTION

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SECTION 01320

PROJECT SCHEDULE

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Schedules

GA Preliminary project schedule, two (2) copies.

GA initial project schedule, two (2) copies  
Activity No. Sort  
Predecessor/successor listing  
Cost Schedule  
Floppy Disk with schedule data in Standard Data Exchange Format (SDEF).  
Activity Code Dictionary.

FIO Periodic schedules updates, monthly updates two (2) copies.  
Floppy Disks with schedule data in Standard Data Exchange Format (SDEF).  
Narrative  
Activity No. Sort  
Cost Schedule  
Cash Flow Report (S-Curve)

SD-08 Statements

Qualifications; GA .

Documentation showing qualifications of personnel preparing schedule reports.

1.2 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports. This person shall have previously created and reviewed computerized schedules. Qualifications of this individual shall be submitted to the Contracting Officer for review with the Preliminary Project Schedule submission.

## PART 2 PRODUCTS (Not Applicable)

## PART 3 EXECUTION

### 3.1 GENERAL

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS a Project Schedule as described below shall be prepared. The scheduling of construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project should also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

### 3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel shall result in an inability of the Contracting Officer to evaluate Contractor progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, then the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

### 3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification including the SDEF (Standard Data Exchange Format). Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer.

#### 3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in Precedence Diagram Method (PDM)

#### 3.3.2 Level of Detail Required

With the exception of the initial and preliminary schedule submission, the Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule.

### 3.3.2.1 Activity Durations

Contractor submissions shall be required to follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods. A rule of thumb, that the Contractor should use, is that less than 2 percent of all non-procurement activities' Original Durations shall be greater than 20 days.

### 3.3.2.2 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing.

### 3.3.2.3 Government Activities

Government and other agencies activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government Furnished Equipment (GFE) and notice to proceed for phasing requirements.

### 3.3.2.4 Responsibility

All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, (at the lowest tier), Contractor work force, or Government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

### 3.3.2.5 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

### 3.3.2.6 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall not normally be changed to reflect modifications.

### 3.3.2.7 Bid Item

All activities shall be identified in the project schedule by the Bid Item to which the activity belongs. An activity shall not contain work in more than one bid item. The bid item for each appropriate activity shall be identified by the Bid Item Code.

### 3.3.2.8 Category of Work

All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited to, to the procurement chain of activities including such items as submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

### 3.3.2.9 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

### 3.3.2.10 Critical Activities

The following activities shall be listed as separate line activities on a Contractor's project schedule:

- submission and approval of mechanical/electric layout drawings
- submission and approval of O&M manuals
- submission and approval of as-built drawings
- submission and approval of 1354 data and installed equipment lists
- submission and approval of testing and air balance (TAB) firm
- submission of TAB specialist design review report
- submission and approval of fire protection specialist
- submission and approval of testing and balancing and HVAC commissioning plans and data
- air and water balance dates
- HVAC commissioning dates
- any other systems testing
- pre-final inspection correction of punch list from pre-final inspection
- final inspection

### 3.3.3 Scheduled Project Completion

The schedule interval shall extend from notice-to-proceed to the contract completion date.

#### 3.3.3.1 Project Start Date

The schedule shall start no earlier than the date that the Notice to Proceed (NTP) was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have: a "ES" constraint, a constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

#### 3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls

after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity call "End Project". The "End Project" activity shall have: a "LF" constraint, a constraint date equal to the completion date for the project, and a zero day duration.

#### 3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted at every project schedule update period to assist the Contracting Officer to evaluate the Contractor's ability to actually complete prior to the contract period.

#### 3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

##### 3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and a zero day duration.

##### 3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

##### 3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.

#### 3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in progress or completed activity and insure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes.

### 3.3.6 Out-of-Sequence Progress

Activities that have posted progress without predecessors being completed (Out-of-Sequence Progress) shall be allowed only by the case-by-case approval of the Contracting Officer. The Contracting Officer may direct that changes in schedule logic be made to correct any or all out-of-sequence work.

### 3.3.7 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

## 3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

### 3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule, defining the Contractor's planned operations for the first 60 calendar days shall be submitted for approval within 10 calendar days after Notice to Proceed is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed 60 calendar days after Notice to Proceed.

### 3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 40 calendar days after Notice to Proceed. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

### 3.4.3 Periodic Schedule Updates

Based on the result of progress meetings, specified in "Periodic Progress Meetings," the Contractor shall submit periodic schedule updates. These submissions shall enable the Contracting Officer or to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgment of the Contracting Officer or authorized representative, is necessary for verifying the contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

### 3.4.4 Standard Activity Coding Dictionary

The Contractor shall submit, with the Initial Project Schedule, a coding scheme that shall be used throughout the project for all activity codes contained in the schedule. The coding scheme submitted shall list the values for each activity code category and translate those values into project specific designations. For example, a Responsibility Code Value, "ELE", may be identified as "Electrical Subcontractor." Activity code values shall represent the same information throughout the duration of the contract. Once approved with the Initial Project Schedule submission, changes to the activity coding scheme must be approved by the Contracting Officer.

### 3.5 SUBMISSION REQUIREMENTS

The as noted in paragraph 1.1 items shall be submitted by the Contractor for the preliminary submission, initial submission, and every periodic project schedule update throughout the life of the project:

#### 3.5.1 Data Disks

Two data disks containing the project schedule shall be provided. Data on the disks shall adhere to the SDEF format specified in ER 1-1-11, Appendix A.

##### 3.5.1.1 File Medium

Required data shall be submitted on 89 mm (3.5 inch) disks, formatted to hold 1.44 MB of data.

##### 3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule, and the version used to prepare the C.P.M.

##### 3.5.1.3 File Name

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will insure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

#### 3.5.2 Narrative Report

A Narrative Report shall be provided with each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the critical path, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to relay to the Government the Contractor's thorough analysis of the schedule output and his plans to compensate for any problems, either current or potential, which are revealed through that analysis

#### 3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

#### 3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early

Finish Date, Late Start Date, Late Finish Date, Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in-progress or completed.

#### 3.5.4.1 Activity Report

A list of all activities sorted according to activity number. For completed activities the Actual Start Date shall be used as the secondary sort.

#### 3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number and then sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort. Preceding and succeeding activities shall include all information listed above in paragraph Schedule Reports. A blank line shall be left between each activity grouping.

#### 3.5.4.3 Total Float Report

A list of all activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates. Completed activities shall not be shown on this report.

#### 3.5.4.4 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the Notice to Proceed until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), Earnings to Date.

#### 3.5.4.5 Cash Flow Report

A report showing scheduled cost of work-in-place by week (tabular report) and a cash flow curve by week (S-curve plot), both based on early dates.

#### 3.5.5 Network Diagram

The time scaled network diagram shall be required on the initial schedule submission and on quarterly update submissions. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

#### 3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity or event number, description, duration, and estimated earned value shall be shown on the diagram.

#### 3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

#### 3.5.5.3 Critical Path

The critical path shall be clearly shown.

#### 3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

#### 3.5.5.5 S-Curves

Earnings curves shall be provided showing projected early and late earnings and earnings to date.

### 3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly on-site meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor will describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

#### 3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

#### 3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

#### 3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost to Date shall be subject to the approval of the Contracting Officer. The following minimum set of items which the Contractor shall address, on an activity by activity basis, during each progress meeting.

### 3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in-progress or completed activities.

### 3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations must be based on Remaining Duration for each activity.

### 3.6.3.3 Cost Completion

The earnings for each activity started. Payment shall be based on earnings for each in-progress or completed activity. Payment for individual activities shall not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

### 3.6.3.4 Logic Changes

All logic changes pertaining to Notice to Proceed on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

### 3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities are those delays beyond the Contractors control such as strikes and unusual weather. Also included are delays encountered due to submittals, Government Activities, deliveries or work stoppage which makes re-planning the work necessary, and when the schedule does not represent the actual prosecution and progress of the work.

## 3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, he shall furnish such justification, project schedule data and supporting evidence as the Contracting Officer may deem necessary for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

### 3.7.1 Justification of Delay

The project schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension, shall be based upon the project schedule updates in effect for the time period in question and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, shall not be a cause for a time extension to the contract completion date.

### 3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of under two weeks based upon the most recent schedule update at the time of the Notice to Proceed or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

- a. A list of affected activities, with their associated project schedule activity number.
- b. A brief explanation of the causes of the change.
- c. An analysis of the overall impact of the changes proposed.
- d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

### 3.7.3 Additional Submission Requirements

For any request for time extension for over 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

## 3.8 DIRECTED CHANGES

If Notice to Proceed (NTP) is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until the Contractor submits revisions, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, then the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor will continue to update their schedule with the Contracting Officer's revisions until a mutual agreement in the revisions may be made. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

## 3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

### 3.10 NAS DATA

The Contractor shall provide the Government with the means to electronically transfer all required NAS data into the Resident Management System (RMS) program using the Standard Data Exchange Format (SDEF). The Contractor may use network analysis software different from that used by the Contracting Officer in the Resident Office, however, the Contractor shall also furnish the following:

NAS data that complies with the Standard Data Exchange Format (SDEF). This is a standard ASCII format for exchanging scheduling data and is compatible with our resident management system. Many software developers provide the capability to convert and export schedule data to the SDEF at no additional cost. The SDEF specifications are in a separate publication, available from the Internet <http://www.cecer.army.mil/PL/SDEF>.

END OF SECTION

## SECTION 01330

### SUBMITTAL PROCEDURES

#### PART 1 GENERAL

##### 1.1 CONTROL AND SCHEDULING OF SUBMITTALS

###### 1.1.1 Submittal Coordination Meeting

After the preconstruction conference and before any submittals are sent to the Contracting Officer's Representative (COR), the Contractor shall meet with the COR and provide and further develop an approved preliminary submittal register, ENG Form 4288. During the meeting all required items will be identified and grouped into three categories:

- Government Approved (G)

Government approval is required for extensions of design, critical materials, variations/deviations, an "or equal" decision, equipment whose compatibility with the entire system must be checked, architectural items such as Color Charts/Patterns/Textures, and other items as designated by the COR. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," these submittals will be acted on as "shop drawings."

- For Information Only

Submittals not requiring Government approval will be for information only. These are items such as Installation Procedures, Certificates of compliance, Samples, Qualifications, etc. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," these submittals will not be acted on as "shop drawings."

- Those items that can be visually inspected by the Contractor's Quality Control Representative (CQC) on site or are provided to the Government other than with an ENG Form 4025: The items that fall into this category shall remain on the register but shall not be submitted to the COR. For these items, the "Classification" column on the submittal register shall remain blank.

###### 1.1.2 Final Submittal Register

The final submittal register shall be coordinated with the progress schedule and submitted within [40] days of Notice to Proceed. In preparing the final document, adequate time (minimum of 30 days) shall be allowed for review and approval, and possible resubmittal of each item on the register.

###### 1.1.3 Submittal Register Updates

The Contractor's quality control representative shall review the listing at least every 30 days and take appropriate action to maintain an effective system. Copies of updated or corrected listings shall be submitted to the COR at least every 30 days in the quantity specified.

##### 1.2 SUBMITTAL TYPES

Throughout these specifications submittals may be identified with the prefix "SD" (submittal data) followed by a number (category, i.e., product data, shop drawings, test reports, etc.). This is for bookkeeping and record sorting in the system. Submittals required are identified as follows:

- SD-01 Preconstruction Submittals
- SD-02 Shop Drawings
- SD-03 Product Data
- SD-04 Samples
- SD-05 Design Data
- SD-06 Test Reports
- SD-07 Certificates
- SD-08 Manufacturer's Instructions
- SD-09 Manufacturer's Field Reports
- SD-10 Operation and Maintenance Data
- SD-11 Closeout Submittals

Submittals required by the Contract Clauses and other non-technical parts of the contract are not necessarily included in this section. These type of submittals can be added to the register before or during the submittal coordination meeting.

### 1.3 APPROVED SUBMITTALS

The approval of submittals by the COR shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist. The Contractor, under the CQC requirements of this contract, is responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all work. After submittals have been approved by the COR, no resubmittal for the purpose of substituting materials or equipment will be given consideration.

### 1.4 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the COR and promptly furnish a corrected submittal in the format and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, written notice, as required under the Contract Clause entitled "Changes," shall be given to the COR.

### 1.5 PAYMENT

Separate payment will not be made for submittals, and all costs associated therein shall be included in the applicable unit prices or lump sum prices contained in the schedule. Payment will not be made for any material or equipment which does not comply with contract requirements.

### PART 2 PRODUCTS (Not Applicable)

## PART 3 EXECUTION

### 3.1 GENERAL

Prior to submittal, all items shall be checked and approved by the Contractor's CQC and each item of the submittal shall be stamped, signed, and dated. Each respective transmittal form (ENG Form 4025) shall be signed and dated by the CQC certifying that the accompanying submittal complies with the contract requirements. This procedure applies to all submittals. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including, but not limited to, catalog cuts, diagrams; operating charts or curves; test reports; test cylinders; samples; O&M manuals including parts lists; certifications; warranties and other such required items. Units of weights and measures used on all submittals shall be the same as the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Government-approval submittals shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. The COR may request submittals in addition to those listed when deemed necessary to adequately describe the work covered in the respective sections. The Contractor shall maintain a complete and up-to-date file of all submittals/items on site for use by both the Contractor and the Government.

### 3.2 SUBMITTAL REGISTER (ENG Form 4288)

The submittal register - ENG Form 4288 – for Divisions 1 through 16 shall be developed by the Contractor prior to the submittal coordination meeting and list each item of equipment and material for which submittals are required in the Technical Specifications. (See paragraph SUBMITTALS at the beginning of each specification section. A blank form ENG 4288 are attached at the end of this specification section.) The Contractor shall approve all items listed on the submittal register. During the submittal coordination meeting, a preliminary submittal register will be created by annotating this Form 4288. When the final submittal register is submitted for approval, the Contractor shall complete the column entitled "Item No." and all data under "Contractor Schedule Dates" and return five completed copies to the COR for approval. The Contractor shall review the list to ensure its completeness and may expand general category listings to show individual entries for each item. The numbers in column "Item No." are to be assigned sequentially starting with "1" for each specification section. DO NOT preassign transmittal numbers when preparing the submittal register. When a conflict exists between the submittal register and a submittal requirement in the technical sections, other than those submittals referenced in Paragraph 3.9: Field Test Reports, the approved submittal register shall govern. The preliminary, and then the final approved submittal register, will become the scheduling documents and will be updated monthly and used to control submittals throughout the life of the contract. Names and titles of individuals authorized by the Contractor to approve shop drawings shall be submitted to COR with the final 4288 form. Supplier or subcontractors certifications are not acceptable as meeting this requirement.

### 3.3 SCHEDULING

Submittals covering component items forming a system, or items that are interrelated, shall be coordinated and submitted concurrently. Certifications shall be submitted together with other pertinent information and/or drawings. Additional processing time beyond 30 days, or number of copies, may be shown by the COR on the submittal register attached in the "Remarks" column, or may be added by the COR during the coordination meeting. No delays damages or time extensions will be allowed for time lost due to the Contractor not properly scheduling and providing submittals.

### 3.4 TRANSMITTAL FORM (ENG Form 4025)

Transmittal Form 4025 (sample at end of this section) shall be used for submitting both Government-approval and information-only submittals in accordance with the instructions on the reverse side of the form. Transmittal numbers shall be assigned sequentially. Electronic generated 4025 forms shall be printed on carbonless paper and be a reasonable facsimile of the original 4025. If electronic forms are

not used, the original 4025 forms shall be used (do not photo copy) and will be furnished by the COR. These forms shall be filled in completely prior to submittal. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.. Each submittal item shall be listed separately on the form, naming subcontractor, supplier, or manufacturer, applicable specification paragraph number(s), drawing/sheet number, pay item number, and any other information needed to identify the item, define its use, and locate it in the work. One or more 4025 forms may be used per specification section, however, DO NOT include more than one specification section per transmittal.

### 3.5 CROSS-REFERENCE (ENG FORM 4288/ENG FORM 4025)

To provide a cross-reference between the approved submittal register and transmittal forms, the Contractor shall record the "transmittal numbers" assigned when submitting items in column "Transmittal No." of the ENG FORM 4288. The item numbers in column "Item No." of submittal register shall correspond to the item numbers on ENG Form 4025.

### 3.6 SUBMITTAL PROCEDURE

#### 3.6.1 General

Shop drawings with 4025 forms shall be submitted in the number of copies specified in subparagraphs "Government Approved Submittals" and "Information Only Submittals," or as indicated on the submittal register in the "Remarks" column. Submit a complete collated "reviewers copy" with one 4025 form and attachments (not originals). The remaining copies (4 for Government-approval, 2 for information-only) of 4025 forms and attachments shall not be collated. This would not apply to a series of drawings.

#### 3.6.2 Approval of Submittals by the Contractor

Before submittal to the COR, the Contractor shall review and correct shop drawings prepared by subcontractors, suppliers, and itself, for completeness and compliance with plans and specifications. The Contractor shall not use red markings for correcting material to be submitted. Red markings are reserved for COR's use. Approval by the Contractor shall be indicated on each shop drawing by an approval stamp containing information as shown in this section. Submittals not conforming to the requirements of this section will be returned to the Contractor for correction and resubmittal.

#### 3.6.3 Variations

For submittals which include proposed variations requested by the Contractor, column "h" of ENG Form 4025 shall be checked and the submittal shall be classified as G, and submitted accordingly. The Contractor shall set forth in writing the justification for any variations and annotate such variations on the transmittal form in the REMARKS block. Variations are not approved unless there is an advantage to the Government. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted variations.

### 3.6.4 Drawings

Each drawing shall be not larger than A1 size (841 mm wide by 594 mm high), with a title block in lower right hand corner and a 75 mm by 100 mm (3 by 4 inch) clear area adjacent. The title block shall contain the subcontractor's or fabricator's name, contract number, description of item(s), bid item number, and a revision block. Provide a blank margin of 20 mm (3/4 inch) at bottom, 50 mm (2 inches) at left, and 10 mm (1/2 inch) at top and right. Where drawings are submitted for assemblies of more than one piece of equipment or systems of components dependent on each other for compatible characteristics, complete information shall be submitted on all such related components at the same time. The Contractor shall ensure that information is complete and that sequence of drawing submittal is such that all information is available for reviewing each drawing. Drawings for all items and equipment, of special manufacture or fabrication, shall consist of complete assembly and detail drawings. All revisions after initial submittal shall be shown by number, date, and subject in revision block.

#### 3.6.4.1 Submittals Containing Drawings Larger than A3 size, (297 mm high by 420 mm wide)

Government-approval submittals containing drawings larger than A3 size, one reproducible and one blue line copy will be required to be submitted with five copies of the ENG Form 4025. The marked-up reproducible (and/or any review comments contained on the page-size comment sheet(s) at the Government's option) will be returned to the Contractor upon review. The Contractor shall provide three copies of blue line drawings (generated from the reviewed reproducible) to the Government within 10 days of Contractor's receipt of the reviewed reproducible. The Contractor shall not incorporate approved work into the project until the Government has received the three blue line copies. The Contractor shall use the marked-up reproducible to make any additional copies as needed. For information-only submittals, one reproducible and two blue line copies shall be submitted with the appropriate number of copies of ENG Form 4025.

### 3.6.5 Printed Material

All requirements for shop drawings shall apply to catalog cuts, illustrations, printed specifications, or other data submitted, except that the 75 mm by 100 mm (3 inch by 4 inch) clear area adjacent to the title block is not mandatory. Inapplicable portions shall be marked out and applicable items such as model numbers, sizes, and accessories shall be indicated by arrow or highlighted.

## 3.7 SAMPLES REQUIRING LABORATORY ANALYSIS

See Section 01451 CONTRACTOR QUALITY CONTROL for procedures and address for samples requiring Government testing.

## 3.8 SAMPLES REQUIRING VISUAL INSPECTION

Samples requiring only physical inspection for appearance and suitability shall be coordinated with the on-site Government quality assurance representative (QAR).

## 3.9 FIELD TEST REPORTS

Routine tests such as soil density, concrete deliveries, repetitive pressure testing shall be delivered to the QAR with the daily Quality Control reports. See SECTION: 01451 CONTRACTOR QUALITY CONTROL.

## 3.10 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

### 3.11 GOVERNMENT APPROVED SUBMITTALS (G)

The Contractor shall submit 5 copies of G submittals with 5 corresponding 4025 forms. Upon completion of G submittal review, copies as specified below will be marked with an action code, dated, and returned to the Contractor. See "Drawings" above for special instructions if drawings larger than size A3 (11 inch by 17 inch) are used.

#### 3.11.1 Processing of G Submittals

Submittals will be reviewed and processed as follows:

a. Approved as Submitted (Action Code "A"): Shop drawings which can be approved without correction will be stamped "Approved" and two copies will be returned to the Contractor. No resubmittal required.

b. Approved Except as Noted (Action Code "B"): Shop drawings which have only minor discrepancies will be annotated in red to indicate necessary corrections. Marked material will be stamped "Approved Except as Noted" and two copies returned to the Contractor for correction. No resubmittal required.

c. Approved Except as Noted (Action Code "C"): Shop drawings which are incomplete or require more than minor corrections will be annotated in red to indicate necessary corrections. Marked material will be stamped "Approved Except as Noted - Resubmission Required" and two copies returned to the Contractor for correction. Resubmittal of only those items needing correction required.

d. Disapproved (Action Code "E"): Shop drawings which are fundamentally in error, cover wrong equipment or construction, or require extensive corrections, will be returned to the Contractor stamped "Disapproved." An explanation will be furnished on the submitted material or on ENG Form 4025 indicating reason for disapproval. Complete resubmittal required.

e. Resubmittal will not be required for shop drawings stamped "A" or "B" unless subsequent changes are made by Contractor or a contract modification. For shop drawings stamped "C" or "E," Contractor shall make corrections required, note any changes by dating the revisions to correspond with the change request date, and promptly resubmit the corrected material. Resubmittals shall be associated with the "parent" by use of sequential alpha characters (for example, resubmittal of transmittal 8 will be 8A, 8B, etc). Government costs incurred after the first resubmittal may be charged to the Contractor.

### 3.12 INFORMATION ONLY SUBMITTALS

The Contractor shall submit three copies of data and four copies of ENG Form 4025. Information-only submittals will not be returned. Government approval is not required on information-only submittals. These submittals will be used for information purposes. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the Contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications and will not prevent the COR from requiring removal and replacement if nonconforming material is incorporated in the work. This does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or check testing by the Government in those instances where the technical specifications so prescribe.

#### 3.12.1 Processing of Information-Only Submittals

Information-only submittals shall be submitted prior to delivery of the material or equipment to the job site. ENG Form 4025 shall be marked with the words "contractor approved - information copy only" in the REMARKS block of the form. Submittals will be monitored and spot checks made. When such checks indicate noncompliance, the Contractor will be notified by the same method used for Government-

approval submittals. Resubmittal of nonconforming information-only submittals shall be reclassified Government-approval and shall be in five copies.

### 3.13 CONTRACTOR APPROVAL STAMP

The stamp used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR:
CONTRACT NUMBER _____
TRANSMITTAL NUMBER _____
ITEM NUMBER _____
SPECIFICATION SECTION _____
PARAGRAPH NUMBER _____
_____ APPROVED AS SUBMITTED
_____ APPROVED WITH CORRECTIONS AS NOTED
SIGNATURE: _____
TITLE: _____
DATE _____

CONTRACTORS REVIEW STAMP  
MAXIMUM SIZE:  
3 INCHES BY 3 INCHES

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# INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for submittals under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal, letter of transmittal is not required.
8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

## THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A --	Approved as submitted.	E --	Disapproved (See attached).
B --	Approved, except as noted on drawings.	F --	Receipt acknowledged.
C --	Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX --	Receipt acknowledged, does not comply as noted with contract requirements.
D --	Will be returned by separate correspondence.	G --	Other (Specify)

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

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## SECTION 01410

### ENVIRONMENTAL PROTECTION

#### PART 1 GENERAL

##### 1.1 SCOPE

This Section covers prevention of environmental pollution and damage as the result of construction operations under this contract. For the purpose of this specification, environmental pollution, and damage is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for esthetic, cultural, and/or historical purposes. The control of environment pollution and damage requires consideration of air, water, and land, and includes management of visual esthetics, noise, and solid waste, as well as other pollutants.

##### 1.2 QUALITY CONTROL

The Contractor shall establish and maintain quality control for environmental protection of all items set forth herein. The Contractor shall record any problems in complying with laws, regulations, and ordinances, and corrective action taken.

###### 1.2.1 Subcontractors

Assurance of compliance with this Section by subcontractors will be the responsibility of the Contractor.

##### 1.3 ENVIRONMENTAL PERMITS AND RESPONSIBILITIES

The Contractor shall be responsible for obtaining and complying with all environmental permits and commitments required by Federal, state, regional, and local environmental laws and regulations.

###### 1.3.1 Notification

When the Contracting Officer notifies the Contractor in writing of any observed noncompliance with Federal, state, or local laws, regulations, or permits, the Contractor shall, after receipt of such notice, inform the Contracting Officer of proposed corrective action and take such action as may be approved. If the Contractor fails to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or costs or damage allowed to the Contractor for any such suspension.

##### 1.4 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals not having a "GA" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan; GA,

## 1.5 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

### 1.5.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, state, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

### 1.5.2 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

- a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.
- b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.
- c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
- d. Description of the Contractor's environmental protection personnel training program.
- e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, state, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.
- f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of

excess or spoil materials including methods to control runoff and to contain materials on the site.

g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff. (See also requirements under Section 01501.)

h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

j. The Spill Control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1 and the Malmstrom AFB OPLAN 42-4. This plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Base Fire Department (911), the Base Environmental Flight (406-731-6012) and USACE Construction Management (406-771-0092) in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July, and October). The report shall indicate the total amount of waste

generated and total amount of waste diverted in cubic meters yards or tons along with the percent that was diverted.

l. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to participate in Federal, state, regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

m. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

n. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, state, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.

o. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, the plan shall include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, the plan shall include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, a copy of the permit and associated documents shall be included as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan shall include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

p. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Contracting Officer.

q. A pesticide treatment plan shall be included and updated, as information becomes available. The plan shall include: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. The Contractor is responsible for Federal, state and local pest management record keeping and reporting requirements as well as any additional Installation Project Office specific requirements. The Contractor shall follow AFI 32-1053 Sections 3.4.13 and 3.4.14 for data required to be reported to the Installation.

## PART 2 PRODUCTS (NOT USED)

## PART 3 EXECUTION

### 3.1 PROTECTION OF ENVIRONMENTAL RESOURCES

The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract shall be protected during the entire period of this contract. The Contractor shall confine his activities to areas defined by the drawings and specifications. Environmental protection shall be as stated in the following subparagraphs:

#### 3.1.1 Protection of Land Resources

The Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without special permission from the Contracting Officer except as otherwise specified or indicated. See Paragraph 3.2 for additional requirements relating to protection of trees during excavation in the vicinity of a tree.

#### 3.1.2 Disposal of Garbage

Garbage shall be placed in containers which are emptied on a regular schedule. All handling and disposal shall be conducted to prevent contamination.

#### 3.1.3 Refuse Disposal and Cleanup

Refuse shall be defined as debris other than organic materials such as brush or tree stumps.

##### 3.1.3.1 Refuse Disposal

The cost of refuse disposal, such as transportation, handling, dumping fees as applicable, and similar cost, shall be included in the contract price. Refuse shall be disposed of off site, in accordance with all local, state, and Federal rules and regulations, at the Contractor's expense.

##### 3.1.3.2 Fire Hazard

Cloths, cotton waste, and other combustible materials that might constitute a fire hazard shall be placed in closed metal containers and placed outside or destroyed at the end of each day.

#### 3.1.4 Restrictions

The Contractor will not be permitted to deposit refuse in existing garbage cans or refuse dumpsters. Cleaners shall not be poured, drained, or washed into plumbing fixtures or sanitary or storm sewers. Debris, dirt, dust, and stains attributable to or resulting from the work effort shall be removed, cleaned, or effaced by the Contractor to the satisfaction of the Contracting Officer prior to acceptance of the job. Refuse shall not be burned. Burning of vegetation or tree stumps will not be allowed unless the worksite is in an area approved for burning.

##### 3.1.4.1 Waste Management and Disposal

State of Montana environmental regulations classify disposal sites for their respective abilities to handle various types of solid waste. Asphalt and concrete waste products are to be disposed of

in licensed Class II and Class III disposal sites respectively. Contractor shall be responsible for complying with the "Montana Solid Waste Management Act" and the "Administrative Rules of Montana" concerning waste management and disposal.

### 3.1.5 Disposal of Chemical or Hazardous Waste

Hazardous waste generated by construction operations remains the property of the Contractor and shall be removed from Malmstrom AFB. Except as specified below, removal of this hazardous waste shall be coordinated with Waste Management, Inc., through the Contracting Officer. Contractor operations shall be, at all times, in compliance with the Resource Conservation and Recovery act (RCRA), 40 CFR, and Montana State Department of Health and Environmental Sciences (MSDHES). The Contractor shall maintain Material Safety Data Sheets (MSDS) for all material used on base and the MSDS' shall be on file on site at the job shack.

3.1.5.1 No more than 200 liters, total, of hazardous waste shall be accumulated by the Contractor on site. Once the 200-liter limit is reached, the Contractor has 72 hours to remove the waste from Malmstrom AFB. If any materials will be used that are corrosive, flammable, toxic, or reactive, the Contractor shall submit a Hazardous Materials/Hazardous Waste Control Plan to the CO for approval and coordination with 341 CES/CEVV. Contractor shall submit Material Safety Data Sheets (MSDS) to the CO for approval and coordination with 341 CES/CEVV for all paints and protective coatings, solvents, adhesives, and all other chemical products.

3.1.5.2 All hazardous materials used by the Contractor on base shall be stored properly in special areas in accordance with all regulatory requirements. The Contractor shall:

- Keep containers closed when not in use.
- Label containers with warning labels.
- Post hazardous signs if required.
- Check routinely for leaks and spills.
- Keep materials at central location.

### 3.1.5.3 PCBs

No PCBs are expected to be encountered in this contract.

### 3.1.5.4 Spills

No hazardous materials shall be sprayed or spilled on the ground, asphalt, or concrete covered surfaces at job sites. The Contractor will be charged for any cleanups and disposal costs done by base personnel. Spills of any type material (excluding clean water) shall be reported for evaluation to determine if clean-up is required. All spill cleanups shall be handled by trained personnel only. Refer to CFR 1910.120. Any hazardous product cleanup on base shall be disposed of through Malmstrom AFB only.

#### 3.1.5.4.1 Spill Response Procedure:

The Contractor shall:

- Notify Construction Management and Base Fire Department of any spills.
- Stop source of spill without undue risk of personnel injury. Use on site containment, safety equipment, and materials.
- Make spill scene off limits to all non-cleanup personnel.
- Restrict all sources of ignition if flammable material in spill.
- Report to Environmental Flight, (telephone (406) 731-6163).

#### 3.1.5.5 LEAD BASED PAINT (LBP)

No LBP shall be used or installed in this contract. LBP containing materials shall be disposed of off Government property as specified in Section 02090 LEAD BASED PAINT (LBP) ABATEMENT AND DISPOSAL. No disposal area is available on the base.

#### 3.1.6 Disposal of Solid Waste

3.1.6.1 The Contractor is responsible for handling and disposal of all solid waste generated at the job site. The Contractor shall make all arrangements for disposal of any wastes including wastes requiring special handling such as asbestos, rubble, or non-hazardous chemical wastes. The Contractor is responsible for laboratory testing and any documentation submittals required by the landfill owner. Montana Department of Environmental Quality (MDEQ) written approval is required for any non-inert materials such as asphalt containing materials, asphalt roofing materials, steel containing materials, etc., that are to be disposed of in the Class III landfill site.

3.1.6.2 All non-hazardous wastes shall be properly disposed of through a licensed landfill site. No landfill site is available on base. Demolition rubble shall not be buried anywhere on base or at the work site. Any cleanups and the costs of these cleanups of improper waste disposals or removals of improperly placed hazardous waste materials shall be the responsibility of the Contractor. Copies of all disposal documents shall be furnished to the Contracting Officer.

#### 3.1.7 Disposal of Discarded Materials

Discarded materials, other than those which can be included in the solid waste category, shall be handled as directed. The Contractor shall provide copies of all weight receipts for solid waste disposal to the Contracting Officer.

#### 3.1.8 Disposal of Asbestos Containing Materials (ACM)

No asbestos-containing materials shall be used or installed under this project work. Asbestos containing materials shall be disposed of off Government property as specified in Section 02085 – REMOVAL AND DISPOSAL OF ASBESTOS MATERIALS. No disposal area is available on the base.

#### 3.1.9 Protection of Water Resources

The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters, including wetlands.

#### 3.1.9.1 Wetlands

The Contractor shall not enter, disturb, destroy, place fill or other materials into or allow discharge of contaminants into any wetlands except as authorized herein. The Contractor shall be responsible for the protection of wetlands shown on the drawings, and marked onsite, in accordance with paragraph ENVIRONMENTAL PERMITS AND RESPONSIBILITIES. Authorization to enter specific wetlands identified shall not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries. The erosion control plan required under this specification shall include measures to prevent silt, soil, and other materials from entering the wetlands from the construction activities.

#### 3.1.9.1 Storm Water and Waste Water System Discharge

3.1.9.1.1 The Contractor shall not dump any restricted materials down the sanitary sewer or waste water disposal system without approval of the Air Force. All discharges to the sewer shall meet Federal, State, and Local regulatory requirements and shall meet the permit requirements limiting Malmstrom AFB discharges. The base sewer discharge is tested weekly by the City of Great Falls for conformance requirements.

3.1.9.1.2 Restricted waste water materials include those that create a fire or explosion hazard; are toxic or poisonous; waters or wastes having a pH lower than 5.5 or higher than 9.0; solid or viscous substances that can obstruct the sewer flow; interfere with the biological activity of a treatment plant; inhibit biological activity by increasing the temperature too much; any fats, wax, grease, or oils in excess of 100 mg/1, noxious or malodorous liquids; contain metals in excess of iron-0.03 mg/1, chromium-16.72 mg/1, copper-15.13 mg/1, zinc-0.51 mg/1, arsenic-1.36 mg/1, cadmium-5.0 mg/1, lead-2.63 mg/1, mercury-0.06 mg/1, nickel-15.57 mg/1 or silver-0.70 mg/1, exceed Malmstrom AFB industrial permit allowable limits; contain phenols or dyes; are radioactive; contain over 100 lbs per day of total suspended solids (TSS) or five day biochemical oxygen demand (BOD), or cause the base waste water discharge to exceed 200 mg/1 BOD or 250 mg/1 TSS.

3.1.9.1.3 The Contractor shall not discharge any contaminated waters to the storm drain system. Prior approval from the Environmental Flight (telephone (406) 731-6437) is required for any questionable liquid discharges.

3.1.9.1.4 The Montana Pollutant Discharge Elimination System (MPDES) regulations (ARM 17.30.1332) requires a storm water discharge permit for construction activity in which clearing, grading and excavation will result in disturbance of >5 acres total or the disturbance of >1 acre if located within 100 feet of a surface water body (stream, river or lake). The Contractor shall submit an Erosion Control Plan designed by qualified personnel and subsequently approved by the Montana Department of Environmental Quality (MDEQ) for Contracting Officer approval prior to construction activities. The objective of the plan is to minimize erosion of disturbed areas during the construction and post construction phases of a project. The Contractor will be required to control all construction operations in strict compliance with the approved Erosion Plan.

### 3.1.10 PROTECTION OF AIR RESOURCES

3.1.10.1 Burning of material is not allowed on base by the Contractor.

3.1.10.2. The maintenance and repair work to air conditioning and refrigeration systems shall require that all CFC handling standards be met. Maintenance and repair work on any equipment used or covered by this contract shall require all CFC handling standards be met.

3.1.10.3. The Contractor shall not vent or cause to be vented CFC and HCFC refrigerants (R-11, R-12, R-22, R-113, R-114, R-115, R-500, R-501, R-502 or other mixtures containing CFCs) to the atmosphere during repair or maintenance work on any equipment covered by this contract.

3.1.10.4. The Contractor shall have available refrigerant recovery or reclaim equipment to perform the work. Any recovered refrigerant from Government owned equipment shall be provided to the Government in EPA approved containers after coordination with the Project Inspector.

3.1.10.5. The Contractor personnel who operate refrigerant reclaim or recycling equipment shall possess the necessary state and local certifications for operating the equipment.

3.1.10.6. The Contractor shall be responsible for meeting all requirements, permitting, licensing and certification required by state or local ordinance to work on refrigeration systems.

#### 3.1.10.7 Particulates

Dust particles, aerosols, and gaseous byproducts from construction activities, processing, and preparation of materials shall be controlled at all times, including weekends, holidays, and hours when work is not in progress. Hydrocarbons and carbon monoxide emissions from equipment shall be controlled to Federal and state allowable limits at all times.

#### 3.1.11 Nuclear Densometers

Where nuclear densometers or other devices containing radioactive elements are used on the project, the Contractor must have a proof of a Nuclear Regulatory Committee (NRC) permit for its use. The Contractor must also keep all radioactive equipment locked up when not in use and remove it from the base at completion of the work day.

### 3.2 PROTECTION OF TREES DURING EXCAVATION

Care shall be exercised by the Contractor when excavating trenches in the vicinity of trees. Where roots are 50 mm in diameter or greater, the trench shall be excavated by hand and tunneled. When large roots are exposed, they shall be wrapped with a heavy burlap for protection and to prevent drying. Trenches dug by machines adjacent to trees having roots less than 50 mm in diameter shall have the sides hand trimmed making a clean cut of the roots. Trenches having exposed tree roots shall be backfilled within 24 hours unless adequately protected by moist burlap or canvas.

### 3.3 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

### 3.4 MAINTENANCE OF POLLUTION CONTROL FACILITIES

The Contractor shall maintain all constructed facilities and portable pollution control devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

### 3.5 RESTORATION OF LANDSCAPE (VEGETATION - SUCH AS TREES, PLANTS, AND GRASS) DAMAGE

All landscape features (vegetation - such as trees, plants, and grass) damaged or destroyed during Contractor operations outside and within the work areas shall be restored to a condition similar to that which existed prior to construction activities unless otherwise indicated on the drawings or in the specifications. This restoration shall be done at no additional cost to the Government. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

Trees shall be replaced in kind with a minimum 100 mm caliper nursery stock. Shrubs, vines, and ground cover shall be replaced in kind; size to be approved by the Contracting Officer.

All plant material shall meet specifications outlined in ANSI Z60.1 - current publication, "American Standard for Nursery Stock."

All disturbed areas shall be revegetated as soon as possible. Grass areas shall be replaced in kind by seeding in accordance with Section 02921 – SEEDING.

All seeding shall be done with certified weed free pure live seed at a rate and composition recommended by the Cascade County Weed Board.

END OF SECTION

## SECTION 01451

### CONTRACTOR QUALITY CONTROL

#### PART 1 GENERAL

##### 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

##### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740	(1999b) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
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ASTM E 329	(1998a) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
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##### 1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the (Price) Schedule.

##### 1.3 LABORATORY VALIDATION

The testing laboratory shall be validated by Corps of Engineers Material Testing Center (MTC) for all tests required by contract. See paragraph 3.7 TESTS.

#### PART 2 PRODUCTS (NOT APPLICABLE)

#### PART 3 EXECUTION

##### 3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

## 3.2 QUALITY CONTROL PLAN

### 3.2.1 General

The Contractor shall furnish for review by the Government, not later than 10 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Government will consider an interim plan for the first 60 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

### 3.2.2 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project manager. If the project manager and project superintendent is the same person, the CQC System Manager shall report to someone higher in the Contractor's organization than the project manager.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.

- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. Laboratory facilities will be validated by the Corps of Engineers Material Testing Center and approved by the Contracting Officer.
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.
- h. Reporting procedures, including proposed reporting formats.
- i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

### 3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

### 3.2.4 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

## 3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 5 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

### 3.4 QUALITY CONTROL ORGANIZATION

#### 3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health manager shall receive direction and authority from the CQC System manager and shall serve as a member of the CQC staff. The Contractor shall provide a CQC organization which shall be at the site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, shop drawings submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

#### 3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, with a minimum of 5 years construction experience on construction similar to this contract or a construction person with a minimum of 10 years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

#### 3.4.3 Additional Requirement

In addition to the above experience education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered at AGC offices throughout the state of Washington and Oregon and at least once a year in Ada county, Idaho.

#### 3.4.4 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

### 3.5 SUBMITTALS AND DELIVERABLES

Submittals shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals are in compliance with

the contract requirements. All Contractor forms for submitting test results are subject to Contracting Officer approval.

### 3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

#### 3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

- a. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Government personnel until final acceptance of the work.
- b. A review of the contract drawings.
- c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. A review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- j. Discussion of the initial control phase.

- k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

### 3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
- g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

### 3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

### 3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable

CQC staff, onsite production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

### 3.7 TESTS

#### 3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements, see Table 1 – Minimum Testing, attached at the end of this specification section. Contractor shall submit all materials test reports on forms standard to industry standards such as ACI, ASTM and AASHTO or with laboratory accreditation forms such as AALA, NIST or NVLAP. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers validated testing laboratory or establish a testing laboratory at the project site which can be validated by the Corps of Engineers in advance of any and all required testing; and in addition, submit proof of validation for approval. The Contractor shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

### 3.7.2 Testing Laboratories

#### 3.7.2.1 Validation

The testing laboratory shall be validated by the Corps of Engineers Materials Testing Center (MTC) for all tests required by the contract prior to the performance of any such testing. The validation of a laboratory is site specific and cannot be transferred or carried over to a facility at a different location. Any and all costs associated with this Government laboratory validation shall be borne by the laboratory and/or the Contractor. Validation of a laboratory is not granted for the entire laboratory activity, but only for the specific procedures requested by the inspected laboratory. The inspected laboratory has full choice of the procedures to be inspected except that the Quality Assurance portion of ASTM E 329 is mandatory to be inspected.

##### (1) Validation Procedures

Validation of a laboratory may consist of either an inspection or audit as defined herein. Validation of all material testing laboratories shall be performed by the MTC. Validation may be accomplished by one of the following processes:

(a) Inspection. Inspection shall be performed by the MTC in accordance with American Society for Testing and Materials (ASTM) standards E329 and D3740.

(b) Audit. A laboratory may be validated by auditing if it has been accredited by the Concrete and Cement Reference Laboratory (CCRL) or AASHTO Materials Reference Laboratory (AMRL) within the past two years in accordance with ASTM E329. Audit shall be performed by the MTC. Inspection by MTC may be required after auditing if one or more of the critical testing procedures required in the project specification were not included in the CCRL or AMRL inspection report or if there is any concern that the laboratory may not be able to provide required services.

#### 3.7.2.2 Standards of Acceptability

(1) Aggregate, concrete, bituminous materials, soil, and rock. Laboratories for testing aggregate, concrete, bituminous materials, soil, and rock shall be validated for compliance with ASTM E 329, Engineer Manual (EM) 1110-2-1906, or project specifications, as applicable.

(2) Water, sediment, and other samples. Laboratories engaged in analysis of water, sediment, and other samples for chemical analysis shall be inspected to assure that they have the capability to perform analyses and quality control procedures described in references in Appendix A as appropriate. The use of analytical methods for procedures not addressed in these references will be evaluated by the CQAB for conformance with project or program requirements.

(3) Steel and other construction materials. Laboratories testing steel and other construction materials shall be validated for capabilities to perform tests required by project requirements and for compliance with ASTM E329.

### 3.7.2.3 Validation Schedule

(1) For all contracted laboratories and project Quality Assurance (QA) laboratories testing aggregate, concrete, bituminous materials, soils, rock, and other construction materials, an initial validation shall be performed prior to performance of testing and at least every two (2) years thereafter.

(2) Laboratories performing water quality, wastewater, sludge, and sediment testing shall be approved at an interval not to exceed eighteen (18) months.

(3) All laboratories shall be revalidated at any time at the discretion of the Corps of Engineers when conditions are judged to differ substantially from the conditions when last validated.

### 3.7.2.4 Validation Process

If a validated laboratory is unavailable or the Contractor selects to use a laboratory which has not been previously validated, Contractor shall coordinate with Corps of Engineers Material Testing Center (MTC) to obtain validation and pay all associated costs. Point of contact at MTC is Daniel Leavell, telephone (601) 634-2496, fax (601) 634-4656, email [daniel.a.leavell@erdc.usace.army.mil](mailto:daniel.a.leavell@erdc.usace.army.mil), at the following address:

U.S. Army Corps of Engineers  
Materials Testing Center  
Waterways Experiment Station  
3909 Hall Ferry Road  
Vicksburg, MS 39180-6199

Procedure for Corps of Engineers validation, including qualifications and inspection/audit request forms are available at the MTC web site:

<http://www.wes.army.mil/SL/MTC/mtc.htm>

Contractor shall coordinate directly with the MTC to obtain validation. Contractor is cautioned the validation process is complicated and lengthy, may require an onsite inspection by MTC staff, correction of identified deficiencies, and the submittal and approval of significant documentation. Estimate a minimum of 60 days to schedule an inspection/submittal and receive a validation. Cost of onsite inspections is \$2500 plus travel time and cost from Vicksburg MS. Cost of audits is \$1500. If an onsite inspection is required following an audit, the cost of the inspection shall be \$1500 plus travel time and cost. The Contractor will be invoiced for actual travel costs and shall submit payment direct to the MTC made payable to the ERDC Finance and Accounting Officer prior to the scheduling of the inspection and/or audit. The Contractor shall copy the Contracting Officer of all correspondence and submittals to the MTC for purposes of laboratory validation.

### 3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

### 3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials will be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Corps of Engineers Division Laboratory, f.o.b., at the following address:

U.S. Army Corps of Engineers  
Materials Testing Center  
Waterways Experiment Station  
3909 Hall Ferry Road  
Vicksburg, MS 39180-6199  
Phone: (601) 634-2496 or (601) 634-3261

ATTN: Project \_\_\_\_\_, Contract Number \_\_\_\_\_

Coordination for each specific test, exact delivery location and dates will be made through the Area Office. If samples are scheduled to arrive at the laboratory on a weekend (after 1700 Friday through Sunday) notify the laboratory at least 24 hours in advance at (601) 634-2496 to arrange for delivery.

## 3.8 COMPLETION INSPECTION

### 3.8.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Special Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the CQC System Manager shall conduct an inspection of the work and develop a punch list of items which do not conform to the approved drawings and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

### 3.8.2 Pre-Final Inspection

The Government will perform this inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

### 3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in

attendance at this inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

### 3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals reviewed, with contract reference, by whom, and action taken.
- g. Off-site surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in plans and/or specifications.
- j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the

Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

### 3.10 SAMPLE FORMS

Sample forms are attached at the end of this specification section.

### 3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

TABLE 1  
 MINIMUM SAMPLING AND TESTING FREQUENCY

<u>Materials</u>	<u>Test</u>	<u>Minimum Sampling and Testing Frequency</u>
<u>Backfills and Subgrade</u>		
Backfill for Trenches, Buildings and Walls, Pavements, and Other Structures	Field Density <sup>2/12/</sup>	Trenches: One test per lift for each increment or fraction of 500 linear feet for backfill. Under pavements, one test every lift and at every crossing.  Walls and Buildings Perimeters, Including Footings: One test per lift for each unit or two per building.  Buildings Slabs on Grade: One test per lift for each slab.
	Lab Density <sup>3/</sup>	One test initially per each type of material or blended material and one every 10 field density tests.
	Gradation <sup>1/</sup>	One test per each type of material or blended material and one every 10 field density tests.
<u>Asphaltic Concrete and Pavements</u> (Non airfield)		
Asphaltic concrete	Marshall method Test	1 test per day minimum.
	Specific Gravity	per each Marshall Test.
	Extraction	1 test for each Marshall Method.
	Gradation <sup>5/</sup>	1 per each extraction test.
	Fracture faces <sup>5/</sup>	1 per each extraction test.

<u>Materials</u>	<u>Test</u>	<u>Minimum Sampling and Testing Frequency</u>
<u>Portland Cement Concrete</u> (Non airfield)		
Coarse and Fine Aggregate <sup>7/</sup>	Moisture, specific gravity and absorption <sup>8/</sup>	1 initially.
	Gradation and fineness modules	1 every 27 cy of concrete.
	Moisture, specific gravity and absorption <sup>8/</sup>	(same as coarse aggregate).
Concrete	Slump	Conduct a test every truck load placed.
	Entrained Air	Conduct with slump test.
	Ambient and concrete temperatures	Conduct with slump tests.
	Unit weight, yield, and water cement ratio	Conduct with strength tests. Check unit weight and adjust aggregate weights to ensure proper yield.
	Compressive strength	One set of 3 cylinders per day and every 27 cubic yards for each class of structural concrete. Test one cylinder at 7 days and two at 28 days.
Vibrators	Frequency and amplitude	Check frequency and amplitude initially and any time vibration is questionable.

NOTES:

- 1/ All acceptance tests shall be conducted from in-place samples.
- 2/ Additional tests shall be conducted when variations occur due to the contractors operations, weather conditions, site conditions, etc.
- 3/ Classification (ASTM D-2487), moisture contents, Atterberg limits and specific gravity tests shall be conducted for each compaction test if applicable.
- 4/ Materials to be submitted only upon request by the Contracting Officer.
- 5/ Tests can substitute for same tests required under "Aggregates" (from bins or source), although gradations will be required when blending aggregates.
- 6/ Increase quantities by 50 percent for Paving mixes and by 100 percent for Government testing of admixtures. Include standard deviation for similar mixes from the intended batch plant and data from a minimum of 30 tests, if available. Refer to ACI 214.
- 7/ A petrographic report for aggregate is required with the sample for source approval. If the total amount of all types of concrete is less than 153 cubic meters (200 c.y.) service records from three separate structures in similar environments which used the aggregates may substitute for the petrographic report.
- 8/ Aggregate moisture tests are to be conducted in conjunction with concrete strength tests for w/c calculations.
- 9/ For less than 1,000 units, the above test may be waived at the discretion of the Contracting Officer and acceptance based on manufacturers certification and test report.
- 10/ Additional tests shall be performed when changes are made either in the manufacturing processes or in materials used in the production of the masonry units.
- 11/ If adequate storage protection is not provided at the jobsite, additional tests shall be made to determine that the allowable moisture condition has not been exceeded before the blocks can be placed in the structure.
- 12/ The nuclear densometer, if properly calibrated, may be used but only in addition to the required testing frequency and procedures using sandcones. The densometer shall be calibrated and is recommended for use when the time for complete results becomes critical.

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(sample of typical Contractor's Daily Report)  
DAILY CONSTRUCTION QUALITY CONTROL REPORT

Contract Number: \_\_\_\_\_ Date: \_\_\_\_\_ Rpt. No. \_\_\_\_\_

Contract Title: \_\_\_\_\_ Location: \_\_\_\_\_

Weather: Clear \_\_\_ P. Cloudy \_\_\_ Cloudy \_\_\_ Rainfall \_\_\_ (\_\_\_% of workday)

Temperature during workday: High \_\_\_\_\_ degrees F. Low \_\_\_\_\_ degrees F.

1. WORK PERFORMED BY CONTRACTOR/SUBCONTRACTOR(S):

<u>Contractor Name</u>	<u>No. of Workers</u>	<u>Crafts/Hours</u>	<u>Work performed</u>
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2. EQUIPMENT DATA:

<u>Type, Size, Etc.</u>	<u>Owned/Rented</u>	<u>Hours Used</u>	<u>Hours Standby</u>
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3. QUALITY CONTROL INSPECTIONS AND RESULTS: (Include a description of preparatory, initial, and/or follow up inspections or meetings; check of subcontractors work and materials delivered to the site compared to submittals and/or specifications; comments on the proper storage of materials; include comments on corrective actions to be taken):

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4. QUALITY CONTROL TESTING AND RESULTS (comment on tests and attach test reports):

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5. DAILY SAFETY INSPECTIONS (Include comments on new hazards to be added to the Hazard Analysis and corrective action of any safety issues):

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6. REMARKS (Include conversations with or instructions from the Government representatives; delays of any kind that are impacting the job; conflicts in the contract documents; comments on change orders; environmental considerations; etc.):

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CONTRACTOR'S VERIFICATION: The above report is complete and correct. All material, equipment used, and work performed during this reporting period are in compliance with the contract documents except as noted above.

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CONTRACTOR QC REPRESENTATIVE

(Sample of Typical Contractor's Test Report)

TEST REPORT

STRUCTURE OR BUILDING \_\_\_\_\_

CONTRACT NO. \_\_\_\_\_

DESCRIPTION OF ITEM, SYSTEM, OR PART OF SYSTEM TESTED:

\_\_\_\_\_  
\_\_\_\_\_

DESCRIPTION OF TEST: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

NAME AND TITLE OF PERSON IN CHARGE OF PERFORMING TESTS FOR THE  
CONTRACTOR:

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

SIGNATURE \_\_\_\_\_

I HEREBY CERTIFY THAT THE ABOVE DESCRIBED ITEM, SYSTEM, OR PART OF  
SYSTEM HAS BEEN TESTED AS INDICATED ABOVE AND FOUND TO BE ENTIRELY  
SATISFACTORY AS REQUIRED IN THE CONTRACT SPECIFICATIONS.

SIGNATURE OF CONTRACTOR  
QUALITY CONTROL INSPECTOR \_\_\_\_\_

DATE \_\_\_\_\_

REMARKS

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

END OF SECTION

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## SECTION 01501

### CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

#### PART 1 GENERAL

##### 1.1 AVAILABILITY OF UTILITY SERVICES

1.1.1 The Government will make electricity, high temperature hot water, natural gas, sewer, and potable water available to the Contractor from existing sources.

1.1.2 The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections at and from approved locations, and shall install and maintain all meters required to measure the amount of electricity, water, natural gas, and high temperature hot water (HTHW) heating, used for the purpose of determining charges. The Contractor shall read these meters and shall provide meter readings to the Contracting Officer on a monthly basis. The Contracting Officer may verify these readings. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, meters, and associated paraphernalia in a manner satisfactory to the Contracting Officer.

1.1.3 Electricity will be billed at the following rate which is the prevailing non-Government rate being charged by the Government to its on-base tenants: \$0.08421 per kWh.

1.1.4 Water will be billed at the following rate which is the prevailing non-Government rate being charged by the Government to its on-base tenants: \$3.20261 per thousand gallons.

1.1.5 HTHW heat will be billed at the following rate which is the prevailing non-Government rate being charged by the Government to its on-base tenants \$11.56772 per million BTU.

1.1.6 Natural gas will be billed at the following rate which is the prevailing non-Government rate being charged by the Government to its on-base tenants \$8.16193 per MCF.

1.1.7 The Contractor will be required to sign a resale agreement for electricity, water, HTHW heating, and natural gas used with the Base Civil Engineer. The Contractor shall coordinate through the Contracting Officer to obtain permits from Base Civil Engineer for connection to utilities. Meter readings shall be read by the Contractor and provided monthly to the 341<sup>st</sup> CES/CECC office for billing purposes. Connection locations and details shall be as approved by Base Civil Engineer. Point of contact at the Base Civil Engineer is Smsgt James Cleary, telephone (406) 731- 6225.

##### 1.2 SANITARY PROVISIONS

Contractor shall provide sanitary accommodations for the use of employees as may be necessary, shall maintain accommodations approved by the Contracting Officer, and shall comply with the requirements and regulations of the State Health Department, County Sanitarian, or other authorities having jurisdiction.

### 1.3 TEMPORARY ELECTRIC WIRING

#### 1.3.1 Temporary Power and Lighting

The Contractor shall provide construction power facilities in accordance with the safety requirements of the National Electric Code NFPA No. 70 and the SAFETY AND HEALTH REQUIREMENTS MANUAL EM 385-1-1. The Contractor, or its delegated subcontractor, shall enforce the safety requirements of electrical extensions for the work of subcontractors. Work shall be accomplished by journeyman electricians.

#### 1.3.2 Construction Equipment

In addition to the requirements of SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-1, temporary wiring conductors installed for operation of construction tools and equipment shall be either Type TW or THW contained in metal raceways, or shall be hard usage or extra hard usage multiconductor cord. Temporary wiring shall be secured above the ground or floor in a workmanlike manner and shall not present an obstacle to persons or equipment. Open wiring may only be used outside of buildings, and then only in accordance with the provisions of the National Electric Code.

#### 1.3.3 Submittals

Submit detailed drawings of temporary power connections. Drawings shall include, but not be limited to, main disconnect, grounding, service drops, service entrance conductors, feeders, GFCI'S, and all site trailer connections.

### 1.4 FIRE PROTECTION

During the construction period, the Contractor shall provide fire extinguishers in accordance with the safety requirements of the SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-1. The Contractor shall remove the fire extinguishers at the completion of construction.

### 1.5 UTILITY LOCATOR/IDENTIFICATION TAPE

Unless specified otherwise elsewhere in the Contract, all installed utility lines shall have a plastic marker tape minimum 150 mm wide and 0.125 mm thick, installed 200 mm to 260 mm below grade, and brightly colored. The plastic marker tape shall include a metallic wire or metal foil backing for detection purposes, and shall bear a continuous printed inscription describing the type of utility line buried below. All underground exterior gas lines shall be provided with a continuous tracer wire (#12 wire) taped to the pipe. Utility line monument markers (concrete with brass identification plugs) shall be installed every 60 meters along straight runs and at each change of direction. Any existing marker tapes or tracer wires damaged during construction shall be repaired to original condition.

### 1.6 STAGING AREA

Contractor will be provided adequate open staging area adjacent to the site, as directed by the Contracting Officer. Area is unsecured, and Contractor shall make provisions for its own security.

Contractor shall be responsible for keeping staging area, and office area clean and free of weeds and uncontrolled vegetation growth. Weeds shall be removed by pulling or cutting to within 1-inch of ground level. Lawn areas shall be mown to keep growth to less than 2-inches. All loose debris and material subject to being moved by prevailing winds in the area shall be picked up or secured at all times.

Temporary storage buildings (excluding tractor trailers) sited in the area shall conform to the base color scheme (Antique Linen, Fed. No. 23578). Architectural and structural features of all temporary facilities, including tractor trailers, shall be maintained in good repair as required by the Contracting Officer. Staging area shall be enclosed by chain link fence 1.8 m high, with access gates. Spare keys to any locked gates shall be provided to the base Fire Department dispatch office. Area shall be kept clean, orderly and free of debris, demolished materials, etc. at all times. If the area is not maintained in a safe and clean condition as defined above, the Contracting Officer may direct the Contractor to perform such actions as necessary to bring the area and facilities up to base standards at no additional cost to the Government, or have the area cleaned by others with the costs being deducted from the Contractor's payment.

## 1.7 HOUSEKEEPING AND CLEANUP

Pursuant to the requirements of Clause CLEANING UP and Clause ACCIDENT PREVENTION, of the CONTRACT CLAUSES, the Contractor shall assign sufficient personnel to insure compliance. The Contractor shall submit a detailed written plan for implementation of this requirement. The plan will be presented as part of the pre-construction safety plan and will provide for keeping the total construction site, structures, and access ways free of debris and obstructions at all times. Work will not be allowed in those areas that, in the opinion of the Contracting Officer, have unsatisfactory cleanup and housekeeping at the end of the preceding day's normal work shift. At least once each day all areas shall be checked by the Quality Control person of the Contractor and the findings recorded on the Quality Control Daily Report. In addition, the Quality Control person shall take immediate action to insure compliance with this requirement. Housekeeping and cleanup shall be assigned by the Contractor to specific personnel. The name(s) of the personnel shall be available at the project site.

## 1.8 CONSTRUCTION NEAR COMMUNICATIONS CABLES

### 1.8.1 Excavation Near Communication Cables

Digging within 3 feet of buried communication cables (including fiber optic cables), electrical cables, and natural gas lines shall be performed by hand digging until the utility is exposed. The Project Inspector shall be notified 3 days prior to digging within a 3-foot area near this utility. A representative from Communications (Telco) must be present during excavation of Communications Cables. The cable piping routes must be marked prior to excavation in the area. A work clearance permit (AF Form 103) must be obtained from Base Civil Engineer Construction Management prior to any excavation work. Information on location of existing utilities will be available with the permit. Air Force personnel will locate the utilities only one time for digging permit purposes. It is the Contractor's responsibility from then on, through acceptance of the project. The Contractor shall be held responsible for any damage to the utility by excavation procedures. Once the utility is exposed, mechanical excavation may be used if there is no chance of damage occurring to the cable or piping systems.

### 1.8.2 Reburial of Exposed Utilities

When existing utility lines are reburied, a tape, detectable by pipe detector systems, shall be installed above the uncovered length of the utility. See paragraph UTILITY LOCATOR/IDENTIFICATION TAPE above for specific tape requirements.

### 1.8.3 Access to Communications Manhole or Handhole

No communications manhole or handhole shall be entered without first obtaining a fiber optic cable briefing. Coordinate through the Contracting Officer with the Base Communications Officer.

### 1.8.4 Cable Cuts or Damage

If a communications cable is cut or damaged the Contractor shall immediately notify the Contracting Officer (CO) and begin gathering personnel and equipment necessary to repair the cut, or damage. Contractor shall begin repairs within one hour of the cut or damage, unless notified otherwise, and continue repairs without interruption until full service is restored.

## 1.9 PROJECT SIGN

Contractor shall furnish and install 1 project sign in accordance with conditions hereinafter specified and layout shown on drawing No. 49s-40-05-15, Sheets 1 and 2, except Corps of Engineers' castle and Department of Air Force seal will be Government furnished. All letters shall be block type, upper case. Letters shall be painted as indicated using exterior-type paint. Sign shall be maintained in excellent condition throughout the life of job. Project sign shall be located as directed. Upon completion of project, sign shall be removed and shall remain the property of Contractor.

## 1.10 ELEVATED WORK AREAS

Workers in elevated work areas in excess of 6 feet above an adjoining surface require special safety attention. In addition to the provisions of SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-1, the following safety measures are required to be submitted to the Contracting Officer's Representative. Prior to commencement of work in elevated work areas, the Contractor shall submit drawings depicting all provisions of his positive fall protection system including, but not limited to, all details of guardrails. Positive protection for workmen engaged in the installation of structural steel and steel joist shall be provided by safety nets, tie-offs, hydraulic man lifts, scaffolds, or other required means. Decking crews must be tied-off or work over nets or platforms not over 6 feet below the work area. Walking on beams and/or girders and the climbing of columns is prohibited without positive protection. Perimeter guardrails shall be installed at floor, roof, or wall openings more than 6 feet above an adjoining surface and on roof perimeters. Rails shall be designed to protect all phases of elevated work including, but not limited to, roofing operations and installation of gutters and flashing. Rails around roofs may not be removed until all work on the roof is complete and all traffic on or across the roof ceases. Rails shall be designed by a licensed engineer to provide adequate stability under any anticipated impact loading. As a minimum, the rails shall consist of a top rail at a height of 1 meter, a mid-rail, and a toe board. Use of tie-offs, hydraulic man lifts, scaffolds, or other means of roof edge protection methods may be utilized on small structures such as family housing, prefabricated metal buildings, etc. If safety belts and harnesses are used, the

positive fall protection plan will address fall restraint versus fall arrest. Body belts will ONLY be used for fall restraint, they will not be used for fall arrest.

#### 1.11 CONCEALED WORK

All items of work to be concealed shall be Government inspected prior to concealment.

#### 1.12 REPAIR OF ROAD CUTS

Asphaltic surface shall be completely in place within 48 hours after placement of base gravel. Between placement of base gravel and pavement, road shall be kept in driveable and passable condition.

#### 1.13 CONSTRUCTION PLANNING MEETINGS

Contractor shall attend a weekly scheduling meeting with the Contracting Officer's Representative and a representative of the using service. During the meeting, the Contractor shall be required to present in writing, and discuss his specific construction plans for, the following 2-week period. The first week's schedule shall be firm and the second weeks' schedule may be tentative and subject to change as conditions warrant. The schedule shall be detailed describing planned work activities, crew sizes and locations, and any utility and access restrictions to base activity which may be caused by planned construction. Any scheduling of outages will be performed at this meeting. Any Contractor activity affecting base security needs, such as scattered crews and number of workers per crew, will be detailed in the written schedule and discussed during the meeting. This weekly meeting is in addition to the construction progress charts or network analysis submission requirements.

#### 1.14 TRAFFIC CONTROL PLAN

The Contractor shall submit a Traffic Control Plan for moving traffic through and around the construction zone in a manner that is conducive to the safety of motorists, pedestrians, and workers. This plan shall indicate scheduling, placement, and maintenance of traffic control devices in accordance with the U.S. Department of Transportation, Federal Highway Administration publication, Manual on Uniform Traffic Control Devices.

##### 1.14.1 Government Approval

The Contractor shall obtain, in writing, from the Base Civil Engineer's Traffic Engineer, through the Contracting Officer, approval of the Traffic Control Plan. The Contractor shall submit the Traffic Control Plan at least 15 working days prior to commencement of street or road work. Streets (except dead end) may be closed to traffic temporarily (except at least one access lane shall be kept open to traffic) by approved written request to the Contracting Officer at least 10 working days prior to street closure. Excavations shall not remain open for more than 1 working day without approval.

##### 1.14.2 Related Requirements

Refer to Section 01005 SITE SPECIFIC SUPPLEMENTARY REQUIREMENTS paragraph 1.8 for additional traffic control measures.

### 1.15 UTILITIES NOT SHOWN

The Contractor can expect to encounter, within the construction limits of the entire project, utilities not shown on the drawings and not visible as to the date of this contract. The Contractor shall scan the construction site with electromagnetic or sonic equipment, and mark the surface of the ground where existing utilities are discovered. The Contractor shall verify the elevations of existing utilities, piping and any type of underground obstruction not indicated, or indicated and not specified to be removed. If such utilities interfere with construction operations, he shall immediately notify the Contracting Officer verbally and then in writing to enable a determination by the Contracting Officer as to the necessity for removal or relocation. If such utilities are removed or relocated as directed, the Contractor shall be entitled to equitable adjustment for any additional work or delay. The types of utilities the Contractor may encounter are waterlines, sewer lines (storm and sanitary), gas lines, fueling lines, steam lines, buried fuel tanks, septic tanks, other buried tanks, communication lines, cathodic protection cabling, and power lines. These utilities may be active or abandoned utilities.

### 1.16 GOVERNMENT WITNESSING AND SCHEDULING OF TESTING

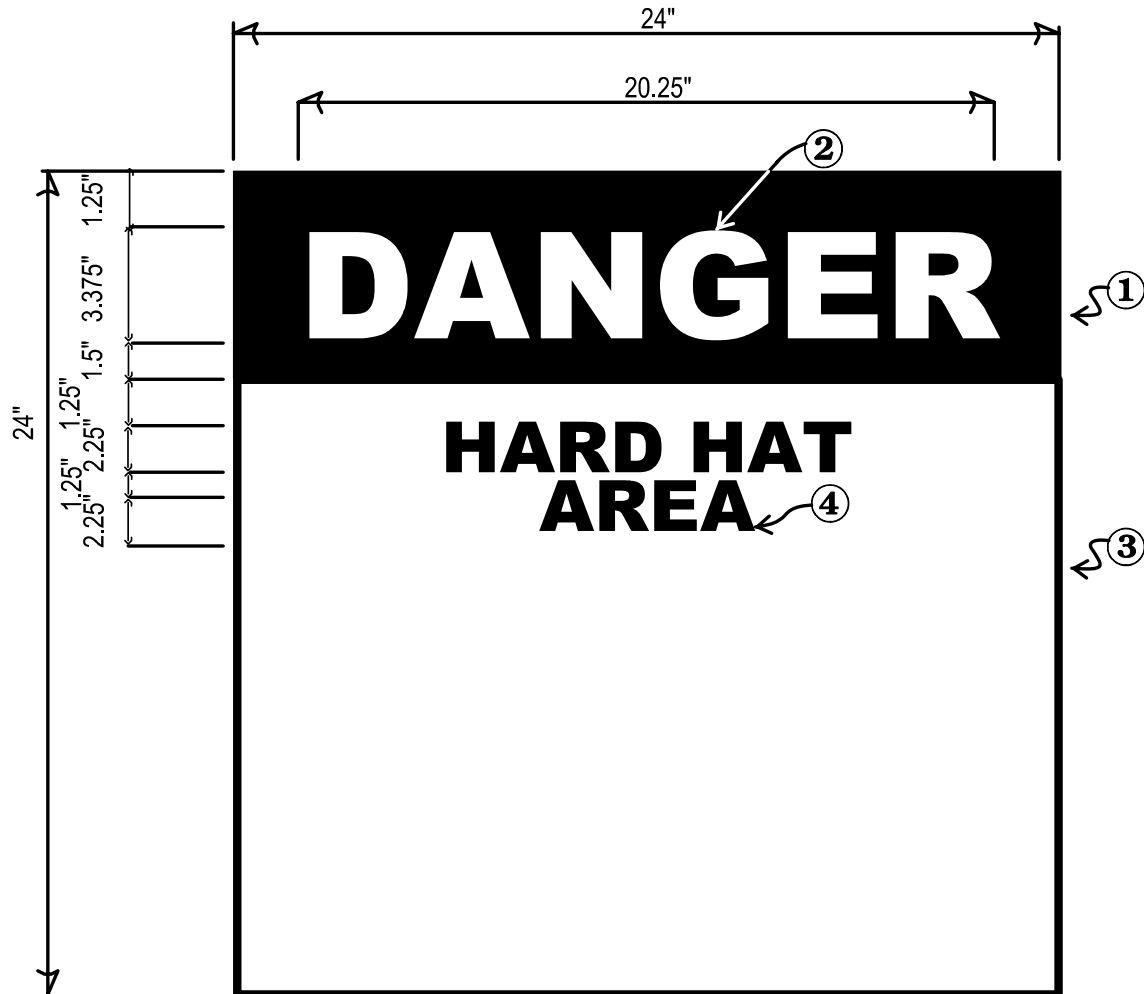
The Contractor shall notify the Contracting Officer, by serial letter, of dates and agenda of all performance testing of the following systems: mechanical (including fire protection and EMCS) and electrical (including fire protection), a minimum of 10 calendar days prior to start of such testing. In this notification, the Contractor shall certify that all equipment, materials, and personnel necessary to conduct such testing will be available on the scheduled date and that the systems have been prechecked by him and are ready for performance and/or acceptance testing. Contractor shall also confirm that all operations and maintenance manuals have been submitted and approved. NO PERFORMANCE AND/OR ACCEPTANCE TESTING WILL BE PERMITTED UNTIL THE OPERATIONS AND MAINTENANCE MANUALS HAVE BEEN APPROVED.

Government personnel, at the option of the Government, will travel to the site to witness testing. If the testing must be postponed or canceled for whatever reason not the fault of the government, the Contractor shall provide the Government not less than 3 working days advance notice (notice may be faxed) of this postponement or cancellation. Should this 3 working day notice not be given, the Contractor shall reimburse the Government for any and all out of pocket expenses incurred for making arrangements to witness such testing including, but not limited to airline, rental car, meal, and lodging expenses. Should testing be conducted, but fail and have to be rescheduled for any reason not the fault of the Government, the Contractor shall similarly reimburse the Government for all expenses incurred.

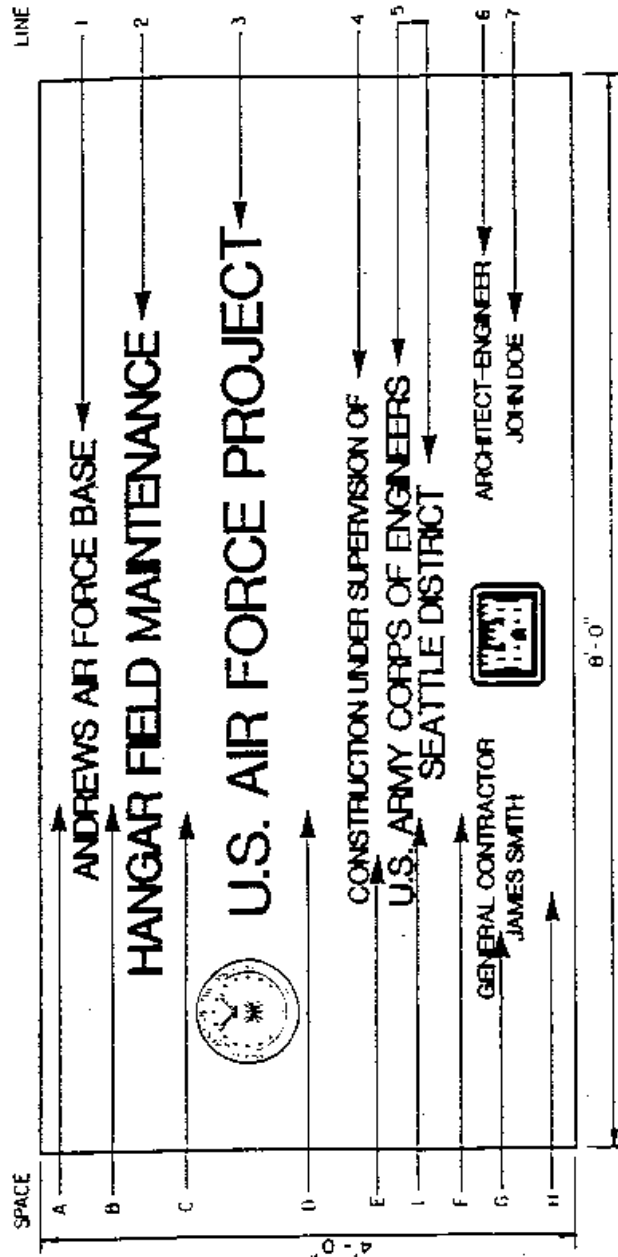
### 1.17 HARD HAT SIGNS

The Contractor shall provide 24 x 24 inch square Hard Hat Area signs at each entry to the project or work area as directed by the Contracting Officer. A minimum of two signs will be required. Signs shall be in accordance with the sketch at the end of this section.

## PART 2 PRODUCTS AND PART 3 EXECUTION (NOT APPLICABLE)



- SIGN SHALL BE FABRICATED FROM .125 THICK 6061-T6 ALUMINUM PANEL
- COLOR
  - 1. SAFETY RED (SR)
  - 2. WHITE
  - 3. WHITE
  - 4. BLACK
- LETTERING SHALL BE HELVETICA BOLD TYPOGRAPHY.
- LETTERS AND BACKGROUND SHALL BE REFLECTIVE SHEETING MATERIAL.
- SIGNS SHALL BE POSTED AT 6'-6" (BOTTOM SIGN TO GRADE) OR AS DIRECTED BY THE CONTRACTING OFFICER.
- LETTERING TO BE CENTERED ON PANEL.



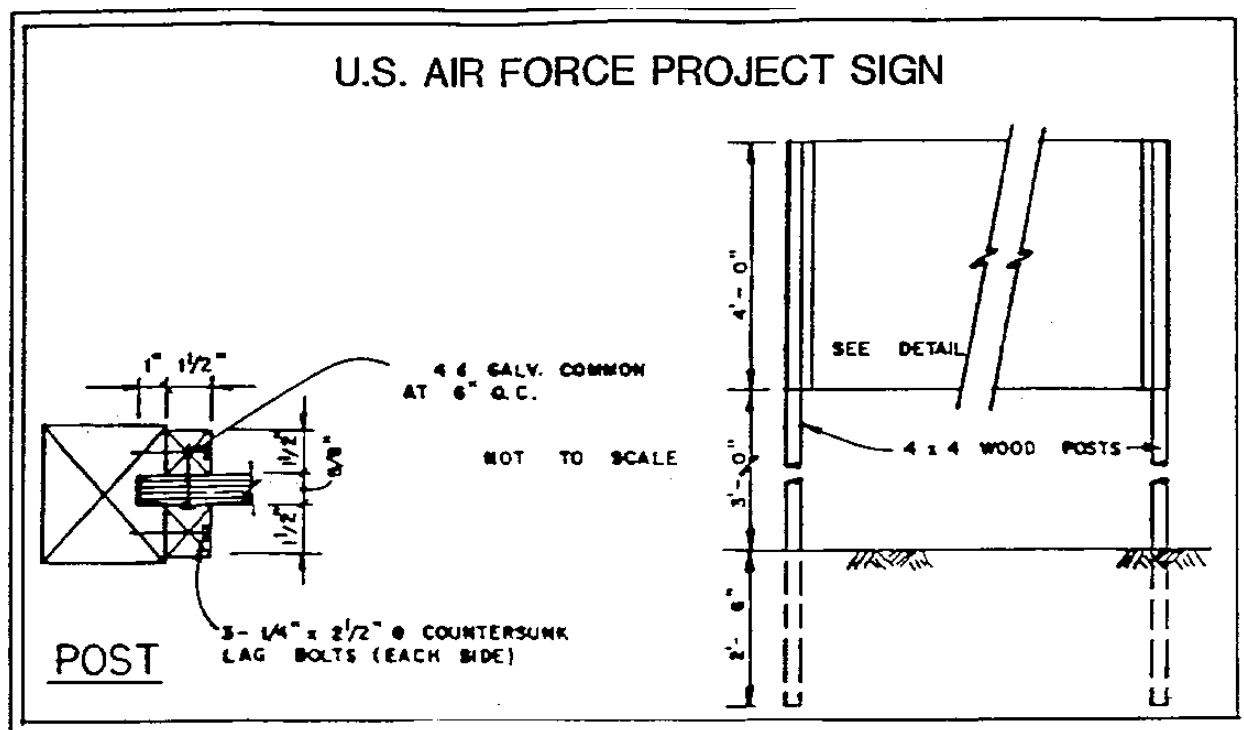
# SAMPLE CONSTRUCTION SIGN FOR MCP PROJECTS

## SCHEDULE

SPACE	HT.	LINE	DESCRIPTION	LETTER	STROKE
					HT.
A	2"	1	LOCATION	2	3/8" 1/4"
B	2 5/8"	2	PROJECT NOMENCLATURE *	2	3/4" 3/8"
C	5 3/4"	3	U.S. AIR FORCE PROJECT	4	1/2"
D	6"	4	CONSTRUCTION UNDER SUPERVISION OF	1 1/2"	1/8"
E	4"	5	CONSTRUCTION AGENCY *	2 3/8"	1/4"
F	4"	6	GENERAL CONTRACTOR *	1 3/8"	3/16"
G	1"	7	GENERAL CONTRACTOR	1 3/8"	3/16"
H	2 7/8"		* WILL VARY TO SUIT PROJECT REQUIREMENTS		
I	2"		SEATTLE DISTRICT		

U.S. AIR FORCE  
 PROJECT  
 CONSTRUCTION SIGN

Sheet 1 of 2  
 U.S. Army Corps of Engineers, Seattle, WA.  
 Pre-qualified with Report  
 Tri-ALM, DATE: 20 JUNE 84  
 GRI ALM, File No. 438 / 40-05-10



## NOTES:

1. Signboard 4' x 8' x 5/8" grade A-C exterior type plywood with medium density overlay on both sides.
2. Paint both sides and edges with one prime coat and two coats of paint, accordance with FED. STD. 595b, color number brown 30118 exterior type enamel. Lettering shall be as shown on drawing and shall be antique linen 33578 gloss exterior type enamel.
3. Lettering shall be Helvetica medium.
4. Acceptable abbreviations may be used for Contractor's name.
5. Department of Air Force Seal and Corps of Engineers' Castle to be Government furnished.
6. No company logo shall be used.
7. Sign posts and  $1\frac{1}{2}"$  wood trim shall be stained dark brown.
8. Upon completion of work under this contract, the project sign shall be removed from the job site and shall remain the property of the Contractor.

SHEET 2 OF 2

END OF SECTION

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## SECTION 01701

### OPERATION AND MAINTENANCE MANUALS

#### PART 1 GENERAL

##### 1.1 SUBMITTALS

Submittals shall be in accordance with Section 01330: SUBMITTAL PROCEDURES.

##### 1.1.1 Preliminary O&M Manual And Data Submittal

To establish and assure uniform O&M manual format, the Contractor shall submit and receive Contracting Officer approval on one (1) complete set of the O&M data package without the binders prior to submission of the final bound manuals for each data package. Initial O & M Manual data submittal shall be a minimum of 30 days prior to 90 percent completion of the first housing unit or other facility to be constructed.

The Contractor shall also provide two typewritten pages representing the proposed binder marking format as required under Paragraph: Marking and Binding. One page will represent the front cover/spine and the other page will represent the inside of the front cover.

1.1.1.1 Data submitted for the manual are to be for the specific equipment furnished, and are in addition to that furnished as shop drawings.

1.1.1.2 The Contracting Officer will require thirty (30) days for review of submitted O&M manual(s) or data. The Contracting Officer will retain one copy of unacceptable O&M manual submittal and return remainder of copies to the Contractor marked "Returned for Correction." If "Returned for Correction." the Contractor shall resubmit the required number of copies of the manual(s) incorporating all comments, prior to substantial completion and/or use and possession. The Contractor may, at its option, update the copy retained by the Government in lieu of providing the added copy.

##### 1.1.2 Final O&M Manual And Data Submittal

##### 1.1.2.1 Number of Manuals

a. Base Housing Office Data Packages: Three copies of the final manuals are required for the complete project. The requirement for three copies of the O&M manual shall supersede and replace any requirements for the number of manuals which may be indicated in other specifications.

b. Occupants Maintenance Manual Data Package: Five copies of the final manual are required for the first completed single family housing unit and one additional copy for each additional completed single family housing unit.

1.1.2.2 For equipment or systems requiring personnel training and/or acceptance testing, the final O&M data shall be approved by the Contracting Officer prior to the scheduling of the training and/or testing. O&M data on equipment or systems not requiring training or testing

shall be submitted so all data will be approved and bound in the O&M manuals in the required quantity by the time the facility reaches 90 percent completion. Failure to furnish approved, bound manuals in the required quantity by the time the facility is 90 percent complete, will be cause for the Contracting Officer to hold or adjust the retained percentage in accordance with CONTRACT CLAUSE, PAYMENTS UNDER FIXED PRICE CONSTRUCTION CONTRACTS.

1.1.2.3 One of the three completed copies of the final O&M Base Housing Office manuals shall contain original manufacturer's data. Data in the remaining manuals may be duplicated copies of original data. All data furnished must be of such quality to reproduce clear, legible copies.

### 1.1.3 Binders

All final submittals for O&M Data Packages shall be bound as follows:

#### 1.1.3.1 Base Engineering/Housing Office Manuals

##### 1.1.3.1.1 Construction and Assembly

Manuals shall be sliding posts or screw-type aluminum binding posts (three screws) with spine, but only one type shall be used for all manuals. The manuals shall be hardback plastic-covered, cleanable, not over three (3) inches thick and designed for 8-1/2 x 11 inch paper. The hard cover shall be of minimum stiffness equal to 0.080 inch display board or double weight illustration board.

##### 1.1.3.1.2 Marking and Binding

As appropriate, systems shall be grouped into four separate categories as follows: Mechanical, Electrical, Fire Protection/Security, and Architectural/General.

Each binder shall have the following information, as a minimum, inscribed on both the spine and cover using an offset or silk screen printing process; "EQUIPMENT OPERATION, MAINTENANCE, AND REPAIR MANUAL;" BUILDING NAME, IDENTIFICATION NUMBER (Building No.), LOCATION, AND DISCIPLINE (MECHANICAL, ELECTRICAL, FIRE PROTECTION/SECURITY, ARCHITECTURAL/GENERAL). Contractor's name and address as well as the contract title and contract number shall be printed on the inside of the front cover.

##### 1.1.3.1.3 Color

Color of binder and printing shall be the option of the Contractor except that; (a) printing color shall contrast with binder color, and (b) colors shall be the same for all manuals.

#### 1.1.3.2 Occupants Maintenance Manual Data Package

##### 1.1.3.2.1 Construction and Assembly

The manuals shall be plastic-covered, designed for 8-1/2 x 11 inch paper. Each binder shall have the following information, as a minimum, visible without opening the manual: "OCCUPANTS MAINTENANCE MANUAL; MALMSTROM AFB."

#### 1.1.3.2.2 Color

Color of binder, interior separator pages and printing shall be subject to the approval of the Base Housing Office.

#### 1.1.4 Changes to Submittals

Manufacturer-originated changes or revisions to submitted data shall be furnished by the Contractor if a component of an item is so affected subsequent to acceptance of the O&M data. Changes, additions, or revision required by the Contracting Officer for final acceptance of submitted data, shall be submitted by the Contractor within 30 calendar days of the notification of this change requirement.

### 1.2 OPERATION AND MAINTENANCE DATA

Operation and maintenance (O&M) data/manuals shall be specifically applicable to this contract and provide a complete and concise description all provided equipment, products and systems. Data containing extraneous information to be sorted through to find applicable instructions will not be accepted. Present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01330, "Submittal Procedures." Additional O&M data requirements are specified in individual sections of the technical specifications. O&M manual requirements shall be coordinated with the requirements specified in the other technical sections of the specifications.

#### 1.2.1 Manual Content

For each product, system, or piece of equipment requiring submission of O&M data, the individual manual content shall, as a minimum, include the items required in the data packages described in the paragraph entitled "Schedule of Operations and Maintenance Data Manual" except irrelevant or inapplicable items need not be included.

### 1.3 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

#### 1.3.1 Operating Instructions

Include specific instructions, procedures, and illustrations for the following phases of operation:

##### 1.3.1.1 Safety Precautions

List personnel hazards and equipment or product safety precautions for all conditions.

##### 1.3.1.2 Normal Operations

Provide narrative description of normal operating procedures. Include control diagrams with data to explain operation and control of systems and specific equipment.

#### 1.3.1.3 Emergency Operations

Include emergency procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include emergency shutdown instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance on emergency operations of all utility systems including valve locations and portions of systems controlled.

#### 1.3.1.4 Operator Service Requirements

Include instructions for services to be performed by the operator for all equipment provided, including lubrication, adjustment, inspection, and gage reading recording.

#### 1.3.1.5 Environmental Conditions

Include a list of environmental conditions (temperature, humidity, and other relevant data) which are best suited for each product or piece of equipment and describe conditions under which equipment should not be allowed to run.

### 1.3.2 Preventive Maintenance

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair.

#### 1.3.2.1 Lubrication Data

Include lubrication data, other than instructions for lubrication in accordance with paragraph entitled "Operator Service Requirements":

- a. A table showing recommended lubricants for specific temperature ranges and applications;
- b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities; and
- c. A lubrication schedule showing service interval frequency.

#### 1.3.2.2 Preventive Maintenance Plan and Schedule

Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance and repair. Provide manufacturer's projection of preventive maintenance work-hours on a daily weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

### 1.3.3 Corrective Maintenance

#### 1.3.3.1 Troubleshooting Guides and Diagnostic Techniques

Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

#### 1.3.3.2 Wiring Diagrams and Control Diagrams

Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation numbering.

#### 1.3.3.3 Maintenance and Repair Procedures

Include instructions and list tools required to restore product or equipment to proper condition or operating standards.

#### 1.3.3.4 Removal and Replacement Instructions

Include step-by-step procedures and list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.

#### 1.3.3.5 Spare Parts and Supply Lists

Include lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. List spare parts and supplies that have a long lead time to obtain.

### 1.3.4 Architectural/General O&M

1.3.4.1 Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Provide information for re-ordering custom manufactured products. Data shall include, but not be limited to, information on carpet, floor tile, vinyl wall finishes, builder's hardware, etc.

1.3.4.2 Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

1.3.4.3 Moisture-protection and Weather-exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

1.3.4.4 Additional Requirements: As specified in individual specifications sections.

### 1.3.5 Appendices

#### 1.3.5.1 Parts Identification

Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number which will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies. Parts data may cover more than one model or series of equipment. components, assemblies, subassemblies, attachments, or accessories, such as a master parts catalog, in accordance with the manufacturer's standard commercial practice. Provide a copy of the nameplate data as shown on each item of equipment furnished.

#### 1.3.5.2 Warranty Information

List and explain the various warranties and include the servicing and technical precautions prescribed by the manufacturers or contract documents to keep warranties in force. Include warranty information for primary components such as the compressor of air conditioning system.

#### 1.3.5.3 Personnel Training Requirements

Provide information available from the manufacturers to use in training designated personnel to operate and maintain the equipment and systems properly.

#### 1.3.5.4 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.

#### 1.3.5.5 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each subcontractor installing the product or equipment. Include local representatives and service organizations most convenient to the project site. Provide the name, address, and telephone number of the product or equipment manufacturers.

### 1.3.6 Occupants Maintenance Manual

This manual is intended as a guide for the use of the occupants of the family housing unit and shall provide general information for use of the housing unit features, including basic operating instructions, care and cleaning instructions, safety precautions, and simple troubleshooting. It

is not intended for performing repair or maintenance requiring trained or experienced personnel.

#### 1.4 SCHEDULE OF OPERATION AND MAINTENANCE DATA MANUAL

Provide O&M data packages with the required information as follows for each item of equipment and systems furnished in accordance with the following schedule:

##### 1.4.1 Data Package 1 – Family Housing Unit (Base Engineering/Housing Office Manual)

As applicable for the equipment or building feature having a motor and some sequence of operation the following data items are required (except data for appliances may be the manufacturer's standard information package provided to retail purchasers) Coordinate with individual technical sections:

- a. Safety precautions
- b. Normal operations
- c. Environmental conditions
- d. Operator service requirements (include general lubrication instructions)
- e. Lubrication data
- f. Troubleshooting guides and diagnostic techniques
- g. Maintenance and repair procedures
- h. Removal and replacement instructions
- i. Spare parts and supply list
- j. Parts identification and nameplate data
- k. Warranty information
- l. Contractor information

##### 1.4.2 Data Package 2 – Family Housing Unit (Base Engineering/Housing Office Manual)

As applicable for architectural/general building features the following data items are required (coordinate with individual technical sections):

- a. Safety precautions
- b. Maintenance and repair procedures
- c. Removal and replacement instructions
- d. Warranty information
- e. Contractor information

##### 1.4.3 Data Package 3 – Site Facilities Other than Family Housing Units (Base Engineering/Housing Office Manual)

As applicable for equipment or systems with motors and specialized controls the following data items are required (coordinate with individual technical sections):

- a. Safety precautions
- b. Normal operations
- c. Emergency operations
- d. Environmental conditions
- e. Operator service requirements (include general lubrication instructions)
- f. Lubrication data
- g. Troubleshooting guides and diagnostic techniques
- h. Preventive maintenance plan and schedule
- i. Wiring Diagrams and Control Diagrams
- j. Maintenance and repair procedures
- k. Removal and replacement instructions
- l. Spare parts and supply list
- m. Parts identification and nameplate data
- n. Warranty information
- o. Contractor information

1.4.4 Data Package 4 – Site Facilities Other than Family Housing Units (Base Engineering/Housing Office Manual)

As applicable for any specialized electrical equipment the following data items are required (coordinate with individual technical sections):

- a. Safety precautions
- b. Operator prestart
- c. Start-up, shutdown, and post shutdown procedures
- d. Normal operations
- e. Environmental conditions
- f. Preventive maintenance plan and schedule
- g. Troubleshooting guides and diagnostic techniques
- h. Wiring and control diagrams
- i. Maintenance and repair procedures
- j. Spare parts and supply list
- k. Testing Equipment and Special Tool
- l. Warranty information
- m. Contractor information

#### 1.4.5 Data Package 5 – Family Housing Unit (Occupants Maintenance Manual)

Suggested format:

##### Table of Contents

- a. Introduction
- b. Emergency Phone Numbers
- c. Cabinets
- d. Counter Tops
- e. Vinyl Siding
- f. Stain Removal Chart for Vinyl Siding
- g. Overhead Doors
- h. Patio Doors
- i. Slate Tile
- j. Sheet Vinyl Floor
- k. Carpet
- l. Paint
- m. Water Heater
- n. Marble
- o. Programmable Thermostat
- p. Gas Furnace
- q. Air Conditioner
- r. Range Hood
- s. Smoke & CO2 Alarms

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

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## SECTION 01702

### AS BUILT RECORDS AND DRAWINGS

#### PART 1 GENERAL

##### 1.1 SUBMITTALS

Data listed in PART 3 of this section shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES. Due dates shall be as indicated in applicable paragraphs and all submittals shall be completed before final payment will be made.

#### PART 2 PRODUCTS (NOT APPLICABLE)

#### PART 3 EXECUTION

##### 3.1 AS-BUILT FIELD DATA

###### 3.1.1 General

The Contractor shall keep at the construction site two complete sets of full size blue-line prints of the contract drawings, reproduced at Contractor expense, one for the Contractor's use, one for the Government. During construction, both sets of prints shall be marked to show all deviations in actual construction from the contract drawings. The color red shall be used to indicate all additions and green to indicate all deletions. The drawings shall show the following information but not be limited thereto:

- a. The locations and description of any utility lines and other installations of any kind or description known to exist within the construction area. The location includes dimensions and/or survey coordinates to permanent features.
- b. The accurate location and dimension of all underground utilities and facilities.
- c. Correct grade or alignment of roads, structures, and utilities if any changes were made from contract plans.
- d. Correct elevations if changes were made in site grading from the contract plans.
- e. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including, but not limited to, fabrication erection, installation, and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.
- f. The topography and grades of all drainage installed or affected as part of the project construction.
- g. All changes or modifications from the original design and from the final inspection.

h. Where contract drawings or specifications allow options, only the option actually used in the construction shall be shown on the as-built drawings. The option not used shall be deleted.

These deviations shall be shown in the same general detail utilized in the contract drawings. Marking of the prints shall be pursued continuously during construction to keep them up to date. In addition, the Contractor shall maintain full size marked-up drawings, survey notes, sketches, nameplate data, pricing information, description, and serial numbers of all installed equipment. This information shall be maintained in a current condition at all times until the completion of the work. The resulting field-marked prints and data shall be referred to and marked as "As-Built Field Data," and shall be used for no other purpose. They shall be made available for inspection by the Contracting Officer's representative whenever requested during construction and shall be jointly inspected for accuracy and completeness by the Contracting Officer's representative and a responsible representative of the Contractor prior to submission of each monthly pay estimate. Failure to keep the As-Built Field Data (including Equipment-in-Place lists) current shall be sufficient justification to withhold a retained percentage from the monthly pay estimate.

### 3.1.2 Submittal of the As-Built Field Data

Two sets of the As-Built Field Data shall be submitted to the Contracting Officer for review and approval a minimum of 20 calendar days prior to the date of final inspection. If review of the preliminary as-built drawings reveals errors and/or omissions, the drawings will be returned to the Contractor for corrections. The Contractor shall make all corrections and return the drawings for backcheck to the Contracting Officer within 10 calendar days of receipt. When submitted drawings are accepted, one set of marked drawings will be returned to the Contractor for the completion of the as-built drawings.

## 3.2 AS-BUILT ELECTRONIC FILE DRAWINGS

3.2.1 No later than 30 days after final acceptance a complete set of as-built drawings shall be submitted in AutoCAD electronic file format. The electronic file format, layering standards and submittal requirements are specified in paragraphs below. The Contractor shall incorporate all deviations from the original contract drawings as recorded in the approved 'As-built Field Data' (see paragraph 3.1.2.). The Contractor shall also incorporate all the written modifications to the contract drawings which were issued by amendment or contract modification. All revisions and changes shall be incorporated, i.e. items marked "deleted" shall be deleted, clouds around new items shall be removed, etc. The as-built drawings shall be done in a quality equal to that of the originals. Line work, line weights, lettering, and use of symbols shall be the same as the original line work, line weights, lettering, and symbols. If additional drawings are required they shall be prepared in electronic file format under the same guidance. When final revisions have been completed, each drawings shall be identified with the words "AS-BUILT" in block letters at least 10 mm high placed above the title block if space permits, or if not, below the title block between the border and the trim line. The date of completion and the words "REVISED AS-BUILT" shall be placed in the revision block above the latest revision notation.

### 3.2.2 Electronic File Submittal Requirements

3.2.2.1 The AutoCAD electronic file(s) deliverable shall be in AutoCAD release 14 'DWG' binary format. All support files required to display or plot the file(s) in the same manner as they

were developed shall be delivered along with the files. These files include but are not limited to Font files, Menu files, Plotter Setup, and Referenced files.

3.2.2.2 Layering shall remain as provided in the electronic files. An explanatory list of which layers are used in each drawing, including any additional layers needed to complete incorporation of the As-Built data, shall be provided with each submittal.

3.2.2.3 Electronic File Deliverable Media: All electronic files shall be submitted in ISO 9660 format CD-ROM (CD). Zip drive disks shall not be provided. Two complete sets of CD(s) shall be submitted along with one complete set of ½ size prints and one complete set of full size mylars taken from the CD(s). The mylars are to be submitted only after corrections are made, if any. See paragraph 3.2.3 below. Each CD shall have a clearly marked label stating the Contractor's firm name, project name and location, submittal type (AS-BUILT), and date the CD was made. Each submittal shall be accompanied by a hard copy transmittal sheet that contains the above information along with tabulated information about all files submitted, as shown below:

<u>Electronic File Name</u>	<u>Plate Number</u>	<u>Drawing Title</u>
-----------------------------	---------------------	----------------------

Electronic version of the table shall be included with each submittal set of disks.

### 3.2.3 Submittal of the Final As-Built Drawings

The final as-built record drawings shall be completed and returned together with the approved preliminary as-built drawings to the COE, Seattle District Office, Technical Branch, Records and Information Section, within 30 calendar days of final acceptance. All drawings from the original contract drawings set shall be included, including the drawings where no changes were made. The Government will review all final as-built record drawings for accuracy and conformance to the drafting standards and other requirements contained in DIVISION 1 GENERAL REQUIREMENTS. The drawings will be returned to the Contractor if corrections are necessary. The Contractor shall make all corrections and shall return the drawings to the same office within 7 calendar days of receipt.

### 3.3 PAYMENT

No partial or total payment will be made for as-built drawings until the complete set of as-built drawings, both marked up blue prints and electronic files are fully approved by the Government (A or B action) and all copies of approved drawings and electronic media received by the Government (see Bid Schedule for details).

### 3.4 ADDITIONAL DRAWINGS

One set of marked-up as-built blueline prints shall be furnished at the time of system acceptance testing. These as-built blueline prints shall be in addition to the submittals of marked-up as-built blueline prints specified elsewhere in the contract.

END OF SECTION

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## SECTION 01703

### WARRANTY OF CONSTRUCTION

#### PART 1 GENERAL

##### 1.1 SUBMITTALS

Submittals shall be made in accordance with SECTION 01330: SUBMITTAL PROCEDURES. Submittal dates shall be as defined in PART 3 of this section.

#### PART 2 PRODUCTS (NOT APPLICABLE)

#### PART 3 EXECUTION

##### 3.1 WARRANTY OF CONSTRUCTION (APR 1994) (FAR52.246-21):

3.1.1 In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph 3.1.9 of this Clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

3.1.2 This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

3.1.3 The Contractor shall remedy at the Contractor's expense, any failure to conform, or any defect. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to Government-owned or controlled real or personal property, when that damage is the result of:

- a. the Contractor's failure to conform to contract requirements or
- b. any defect of equipment, material, workmanship, or design furnished.

3.1.4 The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

3.1.5 The Government will notify the Contractor, in writing or by telephone, after the discovery of any failure, defect, or damage and the Contractor shall respond and be on-site to correct the problem within 1 working day after notification. The Contractor shall furnish, and maintain, a 24 hour emergency telephone number as the point of contact. For failures, defects, or damage causing loss of power or heat, the Contractor shall respond and mitigate the problem within 4 hours.

3.1.6 If the Contractor fails to remedy any failure, defect, or damage within a reasonable time as determined by the Government, after receipt of notice, the Government will have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

3.1.7 With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:

- a. obtain all warranties that would be given in normal commercial practice;
- b. require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and
- c. enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

3.1.8 In the event the Contractor's warranty under paragraph 3.1.2 of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

3.1.9 Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

3.1.10 This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

### 3.2 ADDITIONAL WARRANTY REQUIREMENTS

#### 3.2.1 Pre-Warranty Conference

Prior to contract completion and at a time designated by the Contracting Officer the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of the Paragraph: WARRANTY OF CONSTRUCTION. Communication procedures for the Contractor notification of warranty defects, priorities with respect to the type of defect and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be established/reviewed at this time. The Contractor will furnish the name, telephone number and address of the service representative which is authorized to initiate and pursue warranty work action on behalf of the Contractor. This single point of contact will be located within the local service area of the warranted construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any Contractual responsibilities in connection with the paragraph WARRANTY OF CONSTRUCTION.

NOTE: Local service area is defined as the area in which the Contractor or his representative can meet the response times as described in paragraph WARRANTY OF CONSTRUCTION and in any event shall not exceed 200 miles radius of the construction site.

#### 3.2.2 Equipment Warranty Identification Tags

The Contractor shall provide warranty identification tags on all Contractor and Government furnished equipment which is Contractor installed. (Same equipment as listed on the Equipment-In-Place List required under Section 01705 EQUIPMENT-IN-PLACE LIST).

The tags and information shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation, etc. These tags shall have a permanent pressure-sensitive adhesive back, and shall be installed in a position that is easily noticeable. If the equipment surface is not suitable for adhesive back tags, the Contractor shall submit an alternative to the Government for review and approval. Contractor furnished equipment that has differing warranties on its components will have each component tagged/identified. ). Lettering on the tags shall be block-type upper case and easily readable. Tags shall be similar in format to the following:

EQUIPMENT WARRANTY
CONTRACTOR FURNISHED EQUIPMENT
MFG _____ MODEL NO. _____  SERIAL NO. _____  CONTRACT NO. _____  CONTRACTOR NAME _____  CONTRACTOR ADDRESS _____  CONTRACTOR PHONE NO. _____  DATE WARRANTY EXPIRES _____
IN CASE OF WARRANTY ACTION FIRST CONTACT (Point of contact, including name and telephone number.)

<p style="text-align: center;">EQUIPMENT WARRANTY</p> <p style="text-align: center;">GOVERNMENT FURNISHED EQUIPMENT</p> <p>MFG _____ MODEL NO. _____</p> <p>SERIAL NO. _____</p> <p>CONTRACT NO. _____</p> <p>DATE EQUIPMENT PLACED IN SERVICE _____</p>
--

In the case of equipment repaired or replaced by the Contractor during the warranty period, the Equipment Warranty tag shall be replaced or updated, as applicable, to indicate the scope of the repair/replacement and the new warranty expiration date in accordance with paragraph WARRANTY OF CONSTRUCTION.

END OF SECTION

SECTION 01704

FORM 1354 CHECKLIST

PART 1 GENERAL

1.1 Procedures

The form which is a part of this specification section shall be completed for any project having revisions to real property. The following page contains the basic instructions applicable to the form.

1.2 Submittal

This form shall be submitted for approval, and be approved a minimum of 30 days before final inspection of the project. Failure to have this form completed and approved in time for the final inspection will result in delay of the inspection until the checklist is completed.

PARTS 2 AND 3 NOT USED

## INSTRUCTIONS FOR DD FORM 1354 CHECKLIST

The following checklist is only a guide to describe various parts of new and modified construction. Alter this form as necessary or create your own document to give complete accounting of the real property added or deleted for this contract. All items added, deleted, replaced, or relocated within the building 5 foot line, or on site 5 feet beyond the building perimeter must be accounted for completely. Only a few of the most common items beyond the 5 foot line are included on the checklist under UTILITIES/SURFACE CONSTRUCTION, add additional items as required by the construction accomplished. Attach a continuation sheet and use the checklist format to describe other work related to this particular project. Listed on the last page are additional items with units of measure and descriptive terms.

Costs for each item must include material, tax, installation, overhead and profit, bond and insurance costs. This form should be filled out as each item is installed or each phase of work is completed.

TOTAL FOR ALL ITEMS INCLUDING CONTRACT MODIFICATION COSTS ADDED TOGETHER SHOULD EQUAL THE TOTAL CONTRACT PRICE.

## KEY TO ABBREVIATIONS

AC - Acres  
BL - Barrels, Capacity  
BTU - British Thermal Unit  
CY - Cubic Yards  
EA - Each  
GA - Gallons, Capacity  
HD - Head  
KV - Kilovolt-Amperes, Capacity (KVA)  
KW - Kilowatts, Capacity  
SE - Seats  
SF - Square Feet  
SY - Square Yard  
MB - Million British Thermal Units  
MI - Miles  
LF - Linear Feet  
KG - Thousand Gallons Per Day, Capacity  
TN - Ton  
# - Number; How Many

**DD FORM 1354 CHECKLIST**  
Transfer of Real Property

**CONTRACT  
NUMBER:** \_\_\_\_\_

**CONTRACT  
TITLE:** \_\_\_\_\_

**LOCATION:** \_\_\_\_\_

1. **DEMOLITION** (Describe each item removed and the cost of removal.)\*

2. **RELOCATION** (Describe each item relocated and the cost of relocation.)\*

3. **REPLACEMENTS** (Describe each item replaced and replacement cost.)\*

\*Use a continuation sheet if more space is required. Items should be described by quantity and the correct unit of measure.

**4. NEW CONSTRUCTION OVERVIEW: BUILDING(S)/ADDITION(S) TO A BUILDING** - Use a separate checklist for each building and/or addition.

**(1) Outside Dimensions: Length x Width**

- (a) Main Building \_\_\_\_\_
- (b) Offsets \_\_\_\_\_
- (c) Wings \_\_\_\_\_
- (d) Basement \_\_\_\_\_
- (e) Attic \_\_\_\_\_

**(2) Number of Usable Floors:** \_\_\_\_\_

**(3) Construction: Exterior Materials Used**

- (a) Foundation (such as concrete) \_\_\_\_\_
- (b) Floors (such as wood, concrete) \_\_\_\_\_
- (c) Walls (such as wood siding, metal, CMU) \_\_\_\_\_
- (d) Roof (such as metal, comp., built-up) \_\_\_\_\_

**(4) Utilities ENTERING Building:** Measure LF from Bldg entry to next larger size of pipe

- (a) Water (size & type of pipe; number of LF) \_\_\_\_\_
- (b) Gas (size & type of pipe; number of LF) \_\_\_\_\_
- (c) Sewer (size & type of pipe; number of LF) \_\_\_\_\_
- (d) Electric (phase, voltage, size & type of wire, connected load in amps) \_\_\_\_\_

**(5) Air Conditioning:**

- (a) Type \_\_\_\_\_
- (b) Capacity (TONS) \_\_\_\_\_
- (c) SQ YDS covered by system \_\_\_\_\_

**(6) Heating:**

- (a) Source \_\_\_\_\_
- (b) Fuel \_\_\_\_\_

**(7) Hot Water Facilities:**

- (a) Capacity (GAL) \_\_\_\_\_  
(b) Temperature Rise \_\_\_\_\_

BUILDING COST: \_\_\_\_\_

**5. BUILDING SYSTEMS (INTERIOR)**

**A. FIRE PROTECTION:**

Property Code

- (1) (880 50/880-211) CLOSED HEAD AUTO SPRINKLERS - SF & HD (wet or dry pipe;  
# of LF of service pipe; type of pipe & # of heads; # of SF covered by system)  
DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

- (2) (880 50/880-212) OPEN HEAD DELUGE SYSTEM - SF & HD (# of LF of service pipe;  
type of pipe; # of heads; # of SF covered)  
DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

- (3) (880 10/880-221) AUTO FIRE DETECTION SYSTEM - SF & EA (# of alarms-horns,  
bells, etc.; # of smoke detectors; # of heat detectors; # of fire alarm panels;  
# of radio transmitters/antennae)  
DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

- (4) (880 20/880-222) MANUAL FIRE ALARM SYSTEM - EA (# of pull stations; # of  
alarm horns; # of fire extinguisher cabinets)  
DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

(5) (880 60/880-231) CO2 FIRE SYSTEM (# of bottles & size of bottles in lbs)

DESCRIPTION:

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COST: \_\_\_\_\_

(6) (880 60/880-232) FOAM FIRE SYSTEM - EA (# of tanks - capacity in lbs)

DESCRIPTION:

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COST: \_\_\_\_\_

(7) (880 60/880-233) OTHER FIRE SYSTEM - EA

DESCRIPTION:

---

---

---

COST: \_\_\_\_\_

(8) (880 60/880-234) HALON 1301 FIRE SYSTEM - EA (# of bottles & size of bottles in lbs)

DESCRIPTION:

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COST: \_\_\_\_\_

**B. SECURITY:**

(1) (880 40/872-841) SECURITY ALARM SYSTEM - EA (name of system installed)

DESCRIPTION:

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COST: \_\_\_\_\_

**C. HEATING/COOLING SYSTEMS**

(1) (826 10/890-126) A/C WINDOW UNITS - TN & SF-(# of units installed; amount of SF covered per unit; size & capacity of each unit)

DESCRIPTION:

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COST: \_\_\_\_\_

(2) (826 14/890-125) A/C PLT LESS THAN 5 TN - TN & SF-(# of TN; # of SF covered)

DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(3) (826 13/890-121) A/C PLT 5 TO 25 TN - TN-(# of TN; # of SF covered)

DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(4) (826 12/826-122) A/C PLT 25 TO 100 TN - TN-(# of TN; # of SF covered)

DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(5) (826 11/826-123) A/C PLT OVER 100 TN - TN-(# of TN; # of SF covered)

DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(6) (821 33/821-115) HEATING PLT 750/3500 MB - MB-(# of MBH; type of heating system - Ex: Warm air furnace, central)

DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(7) (821 32/821-116) HEATING PLT OVER 3500 MB - MB-(# of MBH; type of heating system)

DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(8) (811 60/811-147) ELEC EMERGENCY POWER GENERATOR-KW-(size of engine; rating of generator in kilowatts & voltage)

DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(9) (81190 or 82320-gas) STORAGE TANK FOR HEATING or GENERATOR FUEL-GA;  
TYPE;  
FUEL-(Size, type of tank, kind of fuel & # of gallons)  
DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

### **SITE WORK**

#### **6. UTILITIES/SURFACE CONSTRUCTION:**

(1) (812 41/812-223) PRIM DISTR LINE OH-LF-(# LF of wire; size & type of wire;  
# of poles; voltage)  
DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

(2) (812/81360) TRANSFORMERS-KVA  
POWER POLES-LF

(# poles; # transformers - pad or pole mounted; KVA of wire; # LF of wire)  
DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

(3) (812 40/812-224) SEC DISTR LINE OH-LF-(voltage; size & type of wire;  
# transformers; KVA; # LF of wire; # of service drops; # poles)  
DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

(4) (812 42/812-225) PRIM DISTR LINE UG-LF-(KVA; voltage; type of conduit &  
size(encased or direct burial); size & kind of wire inside conduit; LF of wire  
& conduit)  
DESCRIPTION:

\_\_\_\_\_  
\_\_\_\_\_

COST: \_\_\_\_\_

(5) (812 42/812-226) SEC DISTR LINE UG-LF-(type of conduit & size; type & size of wires in conduit; LF of conduit & wire inside conduit; voltage)  
DESCRIPTION:

\_\_\_\_\_

\_\_\_\_\_

COST: \_\_\_\_\_

(6) (812 30/812-926) EXTERIOR LIGHTING-EA-(streets or parking area lights) (# & type of lights; whether pole mounted or not; # LF of connecting wire if pole mounted)  
DESCRIPTION:

\_\_\_\_\_

\_\_\_\_\_

COST: \_\_\_\_\_

(7) (824 10/824-464) GAS MAINS-LF(size, type, & # of LF of pipe)  
DESCRIPTION:

\_\_\_\_\_

\_\_\_\_\_

COST: \_\_\_\_\_

(8) (831 90/831-169) SEWAGE SEPTIC TANK-KG-(size, kind of material, & capacity)  
DESCRIPTION:

\_\_\_\_\_

\_\_\_\_\_

COST: \_\_\_\_\_

(9) (832 10/832-266) SANITARY SEWER-LF-(sizes & types of pipes - # of LF of each; # of cleanouts; # & size of manholes)  
DESCRIPTION:

\_\_\_\_\_

\_\_\_\_\_

COST: \_\_\_\_\_

(10) (842 10/842-245) WATER DISTR MAINS (POTABLE)-LF-(# LF & size, type of pipe)  
DESCRIPTION:

\_\_\_\_\_

\_\_\_\_\_

COST: \_\_\_\_\_

02009/DJ  
Improve Capehart Family Housing, Phase 3, Malmstrom AFB, Montana

(11) (843 11/843-315) FIRE HYDRANTS-EA-(#; size & type)  
DESCRIPTION:

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COST: \_\_\_\_\_

(12) (851 90/851-143) CURBS & GUTTERS-LF-(# LF; material; width & height)  
DESCRIPTION: (Is curb extruded or standard?)\_

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COST: \_\_\_\_\_

(13) (851 90/851-145) DRIVEWAY-SY-(SY; material used; thickness)  
DESCRIPTION:

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COST: \_\_\_\_\_

(14) (851 10/12/851-147) ROAD-SY & LF-(SY; material used; thickness; LF)  
DESCRIPTION:

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COST: \_\_\_\_\_

(15) (85210/11 /852-262) VEHICLE PARKING-SY-(SY; material used; thickness; # of bollards; # of wheel stops; # of regular parking spaces; # of handicap spaces)  
DESCRIPTION:

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COST: \_\_\_\_\_

(16) (852 20/852-289) SIDEWALKS-SY & LF-(# SF & LF; dimensions of each section & location; thickness; material used)  
DESCRIPTION:

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COST: \_\_\_\_\_

(17) (871 10/871-183) STORM DRAIN DISPOSAL-LF-(# LF of pipe; sizes & types of pipe; # of catch basins & manholes & sizes of each)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(18) (872 15/872-247) FENCE, SECURITY (ARMS)-LF-(# of LF; fence material; # & type of gate(s); # strands of barbed wire on top)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(19) (87210/12/872-248) FENCE, INTERIOR-LF-(# of LF; fence material; # & kind of gate(s))  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(20) (890 70/890-187) UTILITY VAULT(4 or more transformers)- SF(# SF; dimensions of vault; # of xfmers)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(21) (135 10/135-583) TEL DUCT FACILITY-LF-(# of LF; size & type of conduit; type of wire)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

(22) (135 10/135-586) TEL POLE FACILITY-LF-(# LF & type of wire; # of poles)  
DESCRIPTION:

\_\_\_\_\_

COST: \_\_\_\_\_

7. **INSTALLED EQUIPMENT:** Furnish an Equipment-In-Place List. Any price related to equipment should already be included in this checklist.

8. **SYSTEMS NOT PREVIOUSLY LISTED:** Attach a separate sheet and use the same format to describe the system(s). Example: CATV system, intercom system, or other utilities and surface construction not described on this checklist.

9. **ASBESTOS REMOVAL:** Furnish a description by building of the number of LF of asbestos removed, number of LF of reinsulation, number of SF of soil encapsulation, and number and size of tanks, etc., where asbestos was removed. Also, identify buildings by their numbers and use.

10. **MAINTENANCE/RENOVATIONS:** List by building number and describe all additions and deletions by quantity and the correct unit of measure. Furnish a cost per building.

**UTILITIES/SURFACE CONSTRUCTION** - Listed below are some additional items which may or may not apply to your contract. EACH item installed on site should be listed and priced separately even if not included on this checklist.

- (1) IRRIGATION SYSTEM-(LF of pipe; size & type of pipe; number and type of heads)
- (2) UNDERGROUND/ABOVEGROUND STORAGE TANKS-(GA, type of tank; material stored)
- (3) (833-354) DUMPSTER ENCLOSURE-(SF & dimensions)
- (4) (890-152) UNLOADING PAD-(SY; material)
- (5) SIGNAGE-(Dimensions; material)
- (6) (12580) CATHODIC PROTECTION-(MI; LF)
- (7) (87270) LIGHTNING PROTECTION-(LF)
- (8) (81290) POLE DUCT RISER-(LF, type of material)
- (9) RAMPS-(SF, material; CY if concrete-use code for sidewalk if concrete)
- (10) (89080/890-158) LOAD AND UNLOAD PLATFORM-(SF)
- (11) (83240/832-255) INDUSTRIAL WASTE MAIN-(LF)
- (12) WHEEL STOPS-(EA; size & material)
- (13) (81350) OUTDOOR INTEGRAL DISTR CTR-(KVA)
- (14) (45110) OUTDOOR STORAGE AREA-(SF)
- (15) (73055/730-275) BUS/WAIT SHELTER-(SF)
- (16) (690-432) FLAGPOLE-(EA; dimensions)
- (17) (93210) SITE IMPROVEMENT-(JOB)
- (18) (93220) LANDSCAPE PLANTING (Acre; EA; SF)
- (19) (93230) LANDSCAPE BERMS/MOUNDS-(SY)
- (20) (93410) CUT AND FILL-(CY)
- (21) (843-315) FIRE HYDRANTS-(EA; Type)
- (22) (14970) LOADING AND UNLOADING DOCKS AND RAMPS (not connected to a Bldg)-(SF)
- (23) BICYCLE RACK-(EA)
- (24) (85140/812-928) TRAFFIC SIGNALS-(EA)
- (25) (87210) FENCING OR WALLS-(LF)
- (26) (15432) RIPRAP-(LF & SY)
- (27) (75061) GRANDSTAND OR BLEACHERS-(EA; SE)
- (28) 87150/871-187) RETAINING WALLS-(LF; SY; material)

NOTE: 5 Digit Codes-Army; 6 Digit Codes-Air Force

END OF SECTION

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## SECTION 01705

### EQUIPMENT-IN-PLACE LIST

#### PART 1 GENERAL

##### 1.1 SUBMITTALS

Data listed in PART 3 of this section shall be submitted in accordance with section 01330 SUBMITTAL PROCEDURES. Due dates shall be as indicated in applicable paragraphs and all submittals shall be completed before final payment will be made.

#### PART 2 PRODUCTS (NOT APPLICABLE)

#### PART 3 EXECUTION

##### 3.1 PREPARATION

The final equipment-in-place list shall be completed and returned to the Contracting Officer within 30 calendar days of the final inspection. The Contracting Officer will review all final Equipment-In-Place Lists for accuracy and conformance to the requirements contained in DIVISION 1 - GENERAL REQUIREMENTS. The lists shall be returned to the Contractor if corrections are necessary. The Contractor shall make all corrections and shall return the lists to the Contracting Officer within 7 calendar days of receipt.

##### 3.2 EQUIPMENT-IN-PLACE LIST

Contractor shall submit for approval, at the completion of construction, a list of equipment-in-place. This list shall be updated and kept current throughout construction, and shall be jointly inspected for accuracy and completeness by the Contracting Officer's representative and a responsible representative of the Contractor prior to submission of each monthly pay estimate. A sample form showing minimum data required is provided at the end of this section. The EQUIPMENT-IN-PLACE LIST shall be comprised of all equipment falling under one or more of the following classifications:

- a. Each piece of equipment listed on the mechanical equipment schedules.
- b. Each electrical panel, switchboard, and MCC panel.
- c. Each transformer.
- d. Each piece of equipment or furniture designed to be movable.
- e. Each piece of equipment that contains a manufacturer's serial number on the name plate.
- f. All Government furnished, Contractor installed equipment per a. through e. (price data excluded)

### 3.3 PAYMENT

No partial or total payment will be made for the 1354 Checklist until both the 1354 Checklist and Equipment in Place List are fully approved by the Government (A or B action) and all copies of approved lists received by the Government (see the [Price] Schedule for details).

### EQUIPMENT-IN-PLACE LIST

**CONTRACT NO.:** \_\_\_\_\_

Specification Section: \_\_\_\_\_ Paragraph No. \_\_\_\_\_

**ITEM DESCRIPTION:** \_\_\_\_\_

Item Name: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Model Number: \_\_\_\_\_

Capacity: \_\_\_\_\_ Replacement Cost \_\_\_\_\_

**ITEM LOCATION:**

Building Number: \_\_\_\_\_ Room Number: \_\_\_\_\_

or Column Location: \_\_\_\_\_

**MANUFACTURER INFORMATION:**

Manufacturer Name: \_\_\_\_\_

Trade Name (if  
different from item name): \_\_\_\_\_

Manufacturer's Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

**WARRANTY PERIOD:** \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

END OF SECTION

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## SECTION 02050- SITE DEMOLITION

### PART 1 - PART GENERAL

#### 1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract apply to work of this section.

#### 1.2 SUMMARY:

- A. The extent of site demolition work is shown on drawings.
- B. Undertake demolition only as it becomes necessary for the completion of the work, and as specified on the drawings. Complete the adjoining or applied work as quickly as possible.

#### 1.3 SUBMITTALS:

- A. Schedule:
  - 1. Procedures: The procedures proposed for the accomplishment of demolition work shall be submitted to the Contracting Officer for review prior to start of work. The procedure shall provide for safe conduct of the work, protection of property, which is to remain undisturbed, coordination with other work in progress, and timely disconnection of utility services. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations.

#### 1.4 OCCUPANCY:

- A. Areas of site to be demolished will be vacated and discontinued in use prior to start of work.

#### 1.5 CONDITION OF STRUCTURES:

- A. Conditions existing at time of inspection for bidding purposes will be maintained by Government insofar as practicable.

#### 1.6 PARTIAL REMOVAL:

- A. Items of salvageable value to Contractor may be removed from structure as work progresses. Salvaged items must be transported from site as they are removed.
  - 1. Storage or sale of removed items on site will not be permitted.
  - 2. Contractor to remove Government's salvage and store where Government directs.
  - 3. Explosives: Use of explosives will not be permitted.
  - 4. NO ACCUMULATION OF LOOSE DEBRIS TO BE LEFT ON THE SITE AT ANY TIME in order to prevent debris from littering the building area.

#### 1.7 TRAFFIC:

- A. Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent, occupied or used facilities.
- B. Do not close or obstruct streets, walks or other occupied used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

1.8 PROTECTIONS:

- A. Protection of Existing Work: Before beginning any cutting or demolition work, carefully survey the existing work and examine the drawings and specifications to determine the extent of the work. Carefully coordinate the work of this section with all work and construct and maintain shoring, bracing and supports, as required. Ensure that structural elements are not overloaded and be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed.
- B. Environmental Protection: All work and Contractor operations shall comply with the requirements of the Section on Environmental Protection.
- C. Use of Explosives: The use of explosives during demolition shall not be permitted.
- D. Barrier: Provide, erect and maintain temporary barriers and security devices.
- E. Landscaping, Fencing, and Site Improvements: The Contractor shall protect existing landscaping, fencing, and other site improvements not required to be disturbed by demolition as per these specifications.
- F. Existing Conditions: Conduct demolition in a manner to minimize interference with adjacent structures. The operation will be conducted in a manner to cause minimum interference with public and private roadways. Egress and access shall be maintained to roadways at all times.

1.9 DAMAGES:

- A. Promptly repair damages caused to adjacent facilities by demolition operations at no cost to the Government.

1.10 UTILITY SERVICES:

- A. Verify locations of all existing utilities prior to commencing demolition work.
- B. Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.
- C. Do not interrupt existing utilities serving or used by facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 DEMOLITION:

- A. Pollution Controls: Use temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level.
- B. Do not use water when it may create hazardous or objectionable conditions or damage contiguous building materials
- C. Clean adjacent areas and improvements of dust, dirt, and debris caused by demolition operations as directed by Government's Representative or governing authorities. Return adjacent areas to condition existing prior to the start of work.
- D. Demolish concrete and masonry in small sections.
- E. Break up and remove concrete slabs-on-grade, where indicated on drawings to be removed, and as required for this project unless otherwise shown to remain.
- F. Prepare area for new installation as required by this document.

3.2 DISPOSAL OF DEMOLISHED MATERIALS:

- A. General: Remove from site debris, rubbish, and other materials resulting from demolition operations. Burning of removed materials from demolished structures will not be permitted on site.
- B. Removal: Transport materials removed from demolished structures and dispose of off site at a location approved by the Government.

END OF SECTION 02050

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## SECTION 02055 - SELECTIVE DEMOLITION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract apply to this section.

#### 1.2 SUMMARY

- A. This Section requires the selective removal and subsequent offsite disposal of the following:

1. Portions of existing buildings indicated on drawings and as required to accommodate new construction.
2. Removal and protection of existing fixtures, materials, and equipment items indicated to be reused.
3. Relocation of pipes, conduits, ducts, and other mechanical and electrical work as per the project requirements.
4. Site improvements, including site utilities.

- B. Removal work specified elsewhere:

1. See Division 2 Section 02150 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of building demolition.
2. Cutting floors and walls for piping, ducts, and conduits is included with the work of the respective mechanical and electrical specification sections in Divisions 15 and 16.
3. Cutting holes in roof for installation of new rooftop mechanical equipment is specified in Division 15.
4. Remodeling construction work and patching are included within the respective sections of specifications, including removal of materials for reuse and incorporation into remodeling or new construction.

#### 1.3 SUBMITTALS

- A. General

1. Submit the following in accordance with Provisions of Contract and Division 1 Specification Sections.
2. Schedule indicating proposed sequence of operations for selective demolition work to Contracting Officer for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.
3. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Government's on-site operations.
4. Coordinate with Government's continuing occupation of portions of existing building and with Government's partial occupancy of completed new addition.

- B. Photographs of existing condition of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with Contracting Officer prior to start of work.

#### 1.4 JOB CONDITIONS

- A. Occupancy: Government will occupy portions of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Government's normal operations. Provide minimum of 72 hours advance notice to Government of demolition activities that will affect Government's normal operations.
- B. Conditions of Structures: Government assumes no responsibility for actual condition of items or structures to be demolished.
  - 1. Conditions existing at time of inspection for bidding purposes will be maintained by Government insofar as practicable. However, minor variations within structure may occur by Government's removal and salvage operations prior to start of selective demolition work.
- C. Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.
  - 1. Storage or sale of removed items on site will not be permitted.
- D. Protections: Provide temporary barricades and other forms of protection to protect Government's personnel and general public from injury due to selective demolition work.
  - 1. Provide protective measures as required to provide free and safe passage of Government's personnel and general public to occupied portions of building.
  - 2. Erect temporary covered passageways as required by authorities having jurisdiction.
  - 3. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities or work to remain.
  - 4. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
  - 5. Protect floors with suitable coverings when necessary.
  - 6. Construct temporary insulated coverings when necessary.
  - 7. Construct temporary insulated dustproof partitions where required to separate areas where noisy extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks.
  - 8. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occur to structure or interior areas of existing building.
  - 9. Remove protections at completion of work.
- E. Damages: Promptly repair damages caused to adjacent facilities by demolition work.
- F. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with road, streets, walks, and other adjacent occupied or used facilities.
  - 1. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

- G. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.
- H. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.
  - 1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
  - 2. Maintain fire protection services during selective demolition operations.
- I. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulation pertaining to environmental protection.
  - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding and pollution.

## PART 2 – PRODUCTS (Not Applicable)

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. General: Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.
  - 1. Cease operations and notify Contracting Officer immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.
  - 2. Cover and protect furniture, equipment, and fixtures from soilage or damage when demolition work is performed in areas where such items have not been removed.
  - 3. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.
    - a. Where selective demolition occurs immediately adjacent to occupied portions of the building, construct dust-proof partitions of minimum 4-inch studs, 5/8-inch drywall (joints taped) on occupied side, 1/2-inch fire-retardant plywood on demolition side. Fill partition cavity with sound-deadening insulation.
    - b. Provide weatherproof closure for exterior openings resulting from demolition work.
  - 4. Locate, identify, stub off, and disconnect utility services that are not indicated to remain.
    - a. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Government if shutdown of service is necessary during changeover.

### 3.2 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations.

- B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during demolition. When permitted by Contracting Officer, items may be removed to a suitable, protected storage location during demolition and cleaned and reinstalled in their original locations after demolition operations are complete.
- C. Existing Utilities: Maintain utility services indicated to remain and protect them against damage during demolition operations.
  - 1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
  - 2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
    - a. Provide at least 72 hours' notice to Owner if shutdown of service is required during changeover.
- D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Division 1 Section "Temporary Facilities and Controls."
  - 1. Protect existing site improvements, appurtenances, and landscaping to remain.
  - 2. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 3. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
  - 4. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.

### 3.3 DEMOLITION

- A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
  - 1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
  - 2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.
  - 3. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.
  - 4. Demolish foundation walls to a depth of not less than 12 inches below existing ground surface. Demolish and remove below-grade wood or metal construction. Break up below-grade concrete slabs.
  - 5. For interior slabs on grade, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.
  - 6. Completely fill below-grade areas and voids resulting from demolition work. Provide fill consisting of approved earth, gravel, or sand, free of trash and debris, stones over 6 inches in diameter, roots, or other organic matter.
  - 7. Remove existing gypsum board from interior surfaces of walls and ceilings to facilitate installation of new electrical systems, insulation and other work indicated.

8. Remove existing deteriorated sub-flooring materials to sound material and remove existing plywood floors in all kitchens and all baths. Leave straight and square cuts at structural supports. Replace with new material to match elevation of adjacent existing flooring.
9. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Contracting Officer in written, accurate detail. Pending receipt of directive from Contracting Officer, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.
- B. Existing Utilities: Abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.
- C. Existing Utilities: Demolish existing utilities and below-grade utility structures that are within 5 feet outside of footprint indicated for new construction. Abandon utilities outside this area.
  1. Fill abandoned utility structures with satisfactory soil materials according to backfill requirements in Division 2 Section "Earthwork."

### 3.4 SALVAGED MATERIALS

- A. Salvaged Items: Where indicated on Drawings as "Salvage - Deliver to Government," carefully remove indicated items, clean, store, and turn over to Government and obtain receipt.
  1. Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance, remain property of Government. Notify Contracting Officer if such items are encountered and obtain acceptance regarding methods of removal and salvage for Government.
  2. Carefully remove, clean, and deliver to government the following items:
    - a. Appliance

### 3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from building site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off site.
  1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
  2. Burning of removed materials is not permitted on project site.

### 3.6 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.
  1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.
- B. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.
- C. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in Division 2 Section 02300 "Earthwork."

- D. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.
- E. General: Promptly repair damage to adjacent construction caused by building demolition operations.
- F. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- G. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

END OF SECTION 02055

## SECTION 02581 - UNDERGROUND DUCTS AND MANHOLES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes conduit and duct and handholes.

#### 1.2 REFERENCES

- A. ASTM C857 - Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
- B. ASTM C858 - Underground Precast Concrete Utility Structures.
- C. ASTM C891 - Installation of Underground Precast Utility Structures.
- D. ASTM C1037 - Inspection of Underground Precast Utility Structures.
- E. IEEE C2 (Institute of Electrical and Electronic Engineers) - National Electrical Safety Code.
- F. NEMA FB 1 (National Electrical Manufacturers Association) - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- G. NEMA TC 2 (National Electrical Manufacturers Association) - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
- H. NEMA TC 3 (National Electrical Manufacturers Association) - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

#### 1.3 SYSTEM DESCRIPTION

- A. Interconnected system of encased conduits, ducts and handholes to distribute medium-voltage power, telephone and cable TV.
- B. Conduit and duct routing and handhole locations are shown in approximate locations unless dimensions are indicated. Route and locate to complete duct bank system.
- C. Medium-voltage: Use rigid plastic conduit.
- D. Telephone: Use rigid plastic conduit.
- E. Cable TV: Use rigid plastic conduit.

#### 1.4 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit for nonmetallic conduit, ducts, and handholes.
- C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01770 - Closeout Procedures: Closeout procedures.
- B. Project Record Documents: Record actual routing and elevations of underground conduit and duct, and locations and sizes of handholes.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.

1.7 COORDINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate Work with existing underground utilities and structures.

PART 2 - PRODUCTS

2.1 PLASTIC CONDUIT

- A. Rigid Plastic Conduit: NEMA TC 2, Schedule 40 PVC, with fittings and conduit bodies to NEMA TC 3.

2.2 HANDHOLES

- A. Description: Molded composite handhole comprising modular, interlocking sections complete with accessories.
- B. Loading: ASTM C857, Class A-16.
- C. Shape: As indicated on Drawings.
- D. Covers: Molded composite with tamperproof fasteners. Furnish cover marked ELECTRIC, TELEPHONE and CABLE TV.
- E. Duct Entry Provisions: Single duct knockouts.
- F. Duct Entry Locations: As indicated on Drawings.
- G. Duct Entry Size: 4 inch .

2.3 ACCESSORIES

- A. Underground Warning Tape: 4 inch wide plastic tape, detectable type, colored red for power, yellow for telephone and cable TV with suitable warning legend describing buried electrical lines.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Verify routing and termination locations of duct bank prior to excavation for rough-in.
- C. Verify locations of handholes prior to excavating for installation.

#### 3.2 EXISTING WORK

- A. Abandoned duct bank to be demolished and removed.
- B. Maintain access to existing duct bank and other installations remaining active and requiring access.
- C. Extend existing duct bank installations using materials and methods.
- D. Clean and repair existing duct bank.

#### 3.3 INSTALLATION - DUCT BANK

- A. Install duct to locate top of ductbank at depths as indicated on Drawings.
- B. Install power, telephone and cable TV conduit and duct to locate top of duct bank minimum 30 inches below finished grade.
- C. Install conduit and duct with minimum slope of 4 inches per 100 feet (0.33 percent). Slope conduit and duct toward handholes and away from building entrances.
- D. Cut conduit and duct square using saw or pipe cutter; de-burr cut ends.
- E. Insert conduit and duct to shoulder of fittings; fasten securely.
- F. Join nonmetallic conduit and duct using adhesive as recommended by manufacturer.
- G. Wipe nonmetallic conduit and duct dry and clean before joining. Apply full even coat of adhesive to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
- H. Install no more than equivalent of three 90-degree bends between pull points.
- I. Install fittings to accommodate expansion and deflection.
- J. Terminate conduit and duct at manhole entries using end bell.
- K. Stagger conduit and duct joints vertically in concrete encasement 6 inches minimum.
- L. Use suitable separators and chairs installed not greater than 4 feet on centers. Secure separators and chairs to trench bottom prior to concrete pour.
- M. Band conduits and ducts together before backfilling or placing concrete.

- N. Securely anchor conduit and duct to prevent movement during concrete placement.
- O. Place concrete in accordance with Section 02611.
- P. Use mineral pigment to color concrete red.
- Q. Install ductbank with minimum 3 inch concrete cover at bottom, top, and sides.
- R. Install two No. 4 steel reinforcing bars in top of bank under paved areas.
- S. Connect to existing concrete encasement using dowels.
- T. Connect to handhole wall using dowels.
- U. Provide suitable pull string in each empty duct except sleeves and nipples.
- V. Swab duct. Use suitable caps to protect installed duct against entrance of dirt and moisture.
- W. Backfill trenches in accordance with Section 02200.
- X. Interface installation of underground warning tape with backfilling specified in Section 02200. Install tape 6 inches below finished surface.

#### 3.4 INSTALLATION-PRE-CAST HANDHOLE

- A. Excavate for handhole installation in accordance with Section 02200.
- B. Install and seal precast sections in accordance with ASTM C891.
- C. Install handholes plumb.
- D. Install drains in handholes and connect to 4 inch pipe terminating in crushed gravel bed.
- E. Backfill handhole excavation in accordance with Section 02200.

END OF SECTION 02581

## SECTION 02060 - CUTTING AND PATCHING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. See other Division 2 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.2 Delete below if special cutting and patching requirements by mechanical and electrical trades are not required.

#### 1.3 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
  - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
  - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
  - 3. Products: List products to be used and firms or entities that will perform the Work.
  - 4. Dates: Indicate when cutting and patching will be performed.
  - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
  - 6. Contracting Officer's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

#### 1.4 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
- C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or

in occupied spaces in a manner that would, in Contracting Officer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
  1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

### 3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Excavating and Backfilling: Comply with other requirements in applicable Division 2 Sections where required by cutting and patching operations.
  - 5. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
  - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

END OF SECTION 02060

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## SECTION 02080 - PIPED UTILITIES - BASIC MATERIALS AND METHODS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Piping materials and installation instructions common to most piping systems.
  - 2. Transition fittings.
  - 3. Sleeves.
  - 4. Grout.
  - 5. Piped utility demolition.
  - 6. Concrete bases.

#### 1.2 DEFINITIONS

- A. Exposed Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions.
- B. Concealed Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

### PART 2 - PRODUCTS

#### 2.1 JOINING MATERIALS

- A. Refer to individual Division 2 piping Sections for special joining materials not listed below.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.
- C. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
  - 1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
    - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
    - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
  - 2. AWWA C110, rubber, flat face, 1/8 inch thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
- D. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- E. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- F. Solvent Cements for Joining Plastic Piping:

1. ABS Piping: ASTM D 2235.
2. CPVC Piping: ASTM F 493.
3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
4. PVC to ABS Piping Transition: ASTM D 3138.

- G. AWWA Transition Couplings: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

## 2.2 SLEEVES

- A. Mechanical sleeve seals for pipe penetrations are specified in Division 15 Section "Basic Mechanical Materials and Methods."
- B. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- C. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.
- D. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- E. Molded PVC: Permanent, with nailing flange for attaching to wooden forms.
- F. PVC Pipe: ASTM D 1785, Schedule 40.
- G. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

## 2.3 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
  2. Design Mix: 5000-psi, 28-day compressive strength.
  3. Packaging: Premixed and factory packaged.

## PART 3 - EXECUTION

### 3.1 PIPED UTILITY DEMOLITION

- A. Refer to Division 2 Sections 02050 "Site Demolition" and 02055 "Selective Demolition" and Division 2 Section 02060 "Cutting and Patching" for general demolition requirements and procedures.
- B. Disconnect, demolish, and remove piped utility systems, equipment, and components indicated to be removed.
1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.

2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
  3. Equipment to Be Removed: Disconnect and cap services and remove equipment.
  4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make operational.
  5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
- C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

### 3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 2 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping to permit valve servicing.
- E. Install piping at indicated slopes.
- F. Install piping free of sags and bends.
- G. Install fittings for changes in direction and branch connections.
- H. Select system components with pressure rating equal to or greater than system operating pressure.
- I. Install sleeves for pipes passing through concrete and masonry walls and concrete floor and roof slabs.
1. Cut sleeves to length for mounting flush with both surfaces.
    - a. Exception: Extend sleeves installed in floors of equipment areas or other wet areas 2 inches above finished floor level.
  2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
    - a. Steel Pipe Sleeves: For pipes smaller than NPS 6.
    - b. Steel Sheet Sleeves: For pipes NPS 6 and larger, penetrating gypsum-board partitions.
- J. Verify final equipment locations for roughing-in.

- K. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

### 3.3 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 2 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- E. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- F. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
  - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
  - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
  - 3. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
  - 4. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
  - 5. PVC Nonpressure Piping: Join according to ASTM D 2855.
  - 6. PVC to ABS Nonpressure Transition Fittings: Join according to ASTM D 3138 Appendix.
- G. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
- H. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.
- I. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
  - 1. Plain-End Pipe and Fittings: Use butt fusion.
  - 2. Plain-End Pipe and Socket Fittings: Use socket fusion.
- J. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

### 3.4 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
  - 1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
  - 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

### 3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment level and plumb, unless otherwise indicated.
- B. Install equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference with other installations. Extend grease fittings to an accessible location.
- C. Install equipment to allow right of way to piping systems installed at required slope.

### 3.6 IDENTIFICATION

- A. Piping Systems: Install pipe markers on each system. Include arrows showing normal direction of flow.
  - 1. Plastic markers, with application systems. Install on insulation segment if required for hot noninsulated piping.
  - 2. Locate pipe markers on exposed piping according to the following:
    - a. Near each valve and control device.
    - b. Near each branch, excluding short takeoffs for equipment and terminal units. Mark each pipe at branch if flow pattern is not obvious.
    - c. Near locations where pipes pass through walls or floors or enter inaccessible enclosures.
    - d. At manholes and similar access points that permit view of concealed piping.
    - e. Near major equipment items and other points of origination and termination.
- B. Adjusting: Relocate identifying devices that become visually blocked by work of this or other Divisions.

### 3.7 CONCRETE BASES

- A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
  - 1. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
  - 2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of the base.
  - 3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
  - 4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 5. Install anchor bolts to elevations required for proper attachment to supported equipment.

6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
7. Use 4000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section 03300 "Cast-in-Place Concrete."

### 3.8 GROUTING

- A. Mix and install grout for equipment base bearing surfaces, pump and other equipment base plates, and anchors.
- B. Clean surfaces that will come into contact with grout.
- C. Provide forms as required for placement of grout.
- D. Avoid air entrapment during placement of grout.
- E. Place grout, completely filling equipment bases.
- F. Place grout on concrete bases and provide smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout.

END OF SECTION 02080

## SECTION 02085 – REMOVAL AND DISPOSAL OF ASBESTOS MATERIALS

### PART 1 - GENERAL

#### 1.1 DESCRIPTION OF WORK

- A. The work covered by this section includes the handling of friable and non-friable asbestos-containing materials during removal operations, and the procedures and equipment required to protect workers and occupants of the housing units, buildings or area from contact with airborne asbestos fibers. The work also includes the disposal of the removed asbestos-containing materials. The asbestos work includes the removal of all sheet flooring/mastic, floor tile/mastic, baseboard mastic, ceiling surface compound, and wallboard and joint compound (>1% asbestos in the joint compound and <1% asbestos in the composite) in the housing units identified. Additionally, the asbestos work includes the removal of limited amounts of asphalt roofing materials as required to facilitate roof renovations as specified elsewhere.
- B. A summary of the asbestos-containing materials identified in representative housing units, their general locations and general quantities is presented in Maxim Technologies, Inc.'s report entitled "Inspection Report of Asbestos and Lead-Based Painted Building Materials – Capehart Family Housing Improvements, Phase 3" dated October 21, 1999. A copy of the report is included as Appendix A to these specifications.

#### 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract apply to work of this section.

#### 1.3 SITE VISIT

- A. Contractor shall visit and investigate the site; review the inspection report, drawings and specifications; assess the amount of asbestos; and become familiar with conditions which will affect the work.

#### 1.4 LIABILITY INSURANCE FOR ASBESTOS

- A. Asbestos abatement liability insurance shall be obtained without additional expense to the Government. The Contractor shall assume full responsibility and liability for the compliance with Federal, state, and local regulations pertaining to training, work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site.

#### 1.5 EXECUTION OF WORK

- A. The work shall be executed as follows:
  - 1. The work included in this project is described in these specifications with accompanying drawings and notes. Contractors must site verify material quantities and site conditions that will affect the bid prices.
  - 2. OSHA Class I and II (friable) asbestos removal that occurs with the housing units or buildings must be accomplished in a negative pressure enclosure as specified herein. Employ sufficient HEPA filtered fan machinery to maintain a negative pressure gradient of minimum 0.02 water inches versus the outside air, and a minimum of four air exchanges per hour. The enclosed area must have critical barriers and containment liners as necessary, waste water filtration devices and other temporary installations to comply with regulations for proper asbestos removal.
  - 3. Each enclosed area (OSHA Class I and Class II friable work) must be equipped with a minimum three stage decontamination unit including clean room, shower room, and

equipment room. Employ bag-out units where feasible with respect to space and bag-out units must be minimum two stage. Shower and wash water must be filtered down to 5 micron particle size prior to discharge. Equip points of entry/exit and barriers to occupied spaces with proper warning signs. Decontamination units located in exterior or interior locations accessible to the public must be constructed of solid sheeting (e.g. plywood, gypsum board, etc.), lockable doors and materials sufficient to provide off hours site security.

4. Remove the asbestos-containing materials in accordance with standard industry methods. Wet removal techniques must be used.
5. Bag or containerize the asbestos waste in approved bags or containers. Removed asbestos material must not be allowed to accumulate in the work area, but shall be collected and containerized on a continuous basis. Ensure the materials are adequately wet at time of containerization.
6. Where clearance air monitoring is required, aggressive clearance air monitoring will be performed as described in these specifications, and samples collected for clearance purposes will be analyzed using phase contrast microscopy (PCM).
7. The following removal notes apply:
  - a. Remove sheet flooring and floor tile where identified. Include removal of any associated mastic on concrete or wood floor substrates. The sheet flooring/floor tile removal work can be performed under non-friable conditions employing methods outlined in "Recommended Work Practices for Removing Resilient Floor Tile, Asphaltic "Cutback" Adhesives, and Sheet Vinyl Flooring," by Armstrong World Industries, or similar recommended practices published by the Resilient Floor Covering Institute. The Contractor must ensure adequately wet conditions during removal and disposal, and partial containments including critical barriers must be in place prior to any work on asbestos-containing flooring materials. If conditions allow, complete flooding of the floor area during flooring removal is a preferred non-friable removal procedure. Methods of flooring removal other than those outlined above are considered friable asbestos removal and all requirements pertaining to OSHA Class I and Class II protective measures and engineering controls apply.
  - b. Mastic associated with sheet flooring/floor tile shall be removed using standard industry methods. If mastic cannot be completely removed from wood substrate floors, remove and dispose of wood substrate floor as asbestos-contaminated waste. If solvent-type mastic removers are used to remove mastic from concrete substrate floors, the mastic remover shall have a flash point greater than 140 degrees F and shall be used in accordance manufacturer's instructions. Following solvent removal activities, concrete substrate floors shall be thoroughly cleaned with a trisodium phosphate cleaning solution to remove all solvent residue.

#### 1.6 APPLICABLE PUBLICATIONS

- A. The publications listed below are incorporated into this specification and shall be read as if printed herein. In case of conflict between the referenced documents and the following text, the stricter requirements shall apply.
  1. MILITARY STANDARD (MIL. STD.)
    - a. MIL-STD-101B Color Code for Pipelines and for Compressed-Gas Cylinders

2. FEDERAL STANDARD (FED. STD.)
  - a. Fed. Std. 595 Colors & Notice 4
3. CODE OF FEDERAL REGULATIONS (CFR):
  - a. 29 CFR 1910.1001 Asbestos
  - b. 29 CFR 1926.1101 Asbestos
  - c. 29 CFR 1910.134 Respiratory Protection
  - d. 29 CFR 1910.141 Shower Rooms
  - e. 29 CFR 1910.145 Specification for Accident Prevention Signs and Tags
  - f. 40 CFR 61, Subpart A General Provisions
  - g. 40 CFR 61, Subpart M National Emission Standard for Asbestos
4. AMERICAN NATIONAL STANDARD INSTITUTE (ANSI):
  - a. Z9.2-79 Fundamentals Governing the Design and Operation of Local Exhaust Systems
  - b. Z88.2-80 Practices for Respiratory Protection

## 1.7 DEFINITIONS

### A. The following definitions apply to work of this section.

1. Abatement - Procedures to control fiber release from asbestos-containing building materials. Includes encapsulation, enclosure, and removal.
2. Airlock - A system for ingress or egress without permitting air movement between a contaminated area and an uncontaminated area, consisting of two curtained doorways at least 6 feet apart.
3. Air Monitoring - The process of measuring the asbestos fiber content of a specific volume of air in a stated period of time.
4. Area Monitoring - Sampling of asbestos fiber concentrations within the asbestos control area and outside the asbestos control area which is representative of the airborne concentrations of asbestos fibers which may reach the breathing zone.
5. Amended Water - Water containing a wetting agent or surfactant.
6. Asbestos - The term includes chrysotile, amosite, crocidolite, tremolite, anthophyllite and actinolite, and any of these that have been chemically treated and/or altered.
7. Asbestos-Containing Material (ACM) - Any material containing more than 1 percent asbestos.
8. Asbestos Control Area - An area where asbestos removal operations are performed which is isolated by physical boundaries to prevent the spread of asbestos dust, fibers, or debris.
9. Asbestos Fibers - For this specification, asbestos fibers are those fibers 5 microns or longer having an aspect ratio of at least 3:1.
10. Authorized Visitor - An authorized visitor as designated by the Contracting Officer, or a representative of any regulatory or other agency having jurisdiction over the project.
11. Certified Industrial Hygienist - The certified industrial hygienist shall be subject to approval as specified in paragraph SUBMITTALS and shall be: 1) Certified by the American Board of Industrial Hygiene and have prior experience in the health and safety aspects of an asbestos removal project, or 2) a professional engineer or certified safety professional with a minimum of 3 years prior experience in industrial hygiene relating to asbestos work.
12. Class I Removal - Class I asbestos work means activities involving the removal of TSI and surfacing ACM and PACM.
13. Class II Removal - Class II asbestos work means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.
14. Class III Removal - Class III asbestos work means repair and maintenance operations, where ACM, including TSI and surfacing ACM and PACM, is likely to be disturbed.

15. Class IV Removal – Class IV asbestos work means maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II and III activities.
16. Clean Room - An uncontaminated area or room which is part of the worker decontamination enclosure system, with storage for workers street clothes and uncontaminated protective equipment.
17. Clearance - Final clearance shall be determined by the certified industrial hygienist from air sample(s) collected in the previously contaminated area and analyzed in accordance with the methods prescribed in 1910.1001 or 1926.1101, Appendix A. Final clearance air samples shall be a minimum volume of 1,500 liters.
18. Competent Person” or “Asbestos Supervisor” - “Competent person” or “Asbestos Supervisor” means one who is capable of identifying existing asbestos hazards in the work place and who has the authority to take prompt corrective measures to eliminate them. The duties of the competent person include at least the following: establishing the negative-pressure enclosure; supervising any employee exposure monitoring required by the standard; ensuring that all employees working within such an enclosure wear the appropriate personnel protective equipment, are trained in the use of appropriate methods of exposure control, and use the hygiene facilities and decontamination procedures specified in the standard; and ensuring that engineering controls in use are in proper operating condition and are functioning properly.
19. Contracting Officer – The authorized representative of the Government.
20. Curtained Doorway - A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, constructed by placing two overlapping sheets of plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of one along one vertical side of the doorway, and securing the vertical edge of the other sheet along the opposite vertical side of the doorway.
21. Disposal - Procedures necessary to transport and deposit the asbestos contaminated material stripped and removed from the building, piping, and equipment in an approved waste disposal site in compliance with the EPA regulations.
22. Encapsulant - A liquid material which can be applied to asbestos-containing material and which controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).
23. Encapsulation - Procedures necessary to coat all asbestos-containing materials with an encapsulant to control the possible release of asbestos fibers into the ambient air.
24. Enclosure - All herein specified procedures necessary to complete enclosure of all asbestos-containing material behind airtight, impermeable, permanent barriers.
25. Equipment Room - A contaminated area or room which is part of the worker decontamination enclosure system, with storage for contaminated clothing and equipment.
26. Excursion Limit - No employee shall be exposed to an airborne concentration of asbestos, in any combination of the minerals defined, in excess of one fiber per cubic centimeter over a period of 30 minutes in locations subject to OSHA regulations. Excursion limit is an OSHA defined term which may also be referred to as "STEL", Short Term Exposure Limit, or as Ceiling Concentration. Method of determination shall be as described in 1926.1101 Appendix A, or an equivalent method recognized and approved by applicable regulatory agencies.
27. Friable Asbestos Material - Material that contains more than 1 percent asbestos by weight and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.
28. Glove Bag System - A portable asbestos abatement system designed for isolation of small groups of pipe fittings, etc., requiring asbestos removal.
29. HEPA Filter Equipment - High efficiency particulate air filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall be capable of trapping and retaining at least 99.97 percent of 0.3 micrometer diameter mono dispersed particles.

30. Negative Pressure Fan System - An air purifying fan system located within or outside the isolated work area, which draws air out of the work area through a HEPA filter, thus keeping the static air pressure in the work area lower than in adjacent areas and preventing exfiltration of contaminated air from work area to adjacent areas.
31. Non-friable Asbestos Material - Material that contains asbestos in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not release fibers in excess of the asbestos control limit during any appropriate use, handling, demolition, storage, transportation, processing, or disposal.
32. Permissible Exposure Limit (PEL) - No employee shall be exposed to an airborne concentration of asbestos, in any combination of the minerals defined, in excess of 0.1 fibers per cubic centimeter as an 8-hour time weighted average (TWA), or 1.0 fibers per cubic centimeter as averaged over a 30-minute sampling period, as determined by the method prescribed in 1926.1101 Appendix A or an equivalent method recognized and approved by applicable regulatory agencies.
33. Personal Monitoring - Sampling of asbestos fiber concentrations within the breathing zone (within 12 inches of the mouth) of an employee.
34. Presumed Asbestos-Containing Material (PACM) – means thermal system insulation and surfacing material found in buildings constructed no later than 1980.
35. Prior Experience - Experience required of the Contractor/industrial hygienist on asbestos projects of similar nature and scope to ensure capability of performing the asbestos removal in a satisfactory manner. Similarities shall be in areas related to material composition, project size, number of employees, and the engineering work practice and personal protection controls required.
36. Shower Room - A room between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water and arranged for complete showering during decontamination. The shower room comprises an airlock between contaminated and clean areas.
37. Surfactant - A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
38. Tack Coat - A coat of penetrating encapsulant applied to all surfaces from which asbestos-containing materials have been removed. Tack coat shall not be used over flooring substrates unless encapsulant to be used has been determined to be compatible with new flooring.
39. Thermal System Insulation (TSI) – means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.
40. Time Weighted Average (TWA) - The TWA is an 8-hour time weighted average airborne concentration of asbestos fibers. Methods for determination shall be as prescribed in Appendix A of 1910.1001 or 1926.1101 as applicable. Employee exposures shall be determined on the basis of three or more samples representing full-shift exposures for each shift for each employee in each job classification in each work area.
41. Wet Cleaning - The process of eliminating asbestos from building surfaces and objects by using cloths, mops, or other cleaning tools dampened with water.
42. Work Area - An isolated area of the facility where abatement activities are performed.
43. Worker Decontamination Enclosure System - A decontamination system for workers, consisting of a clean room, a shower room, and an equipment room. One entrance to the clean room shall be outside of the contaminated area. One entrance to the equipment room shall be connected directly to the contaminated area.

## 1.8 SUBMITTALS

### A. Certificates of Compliance

1. Submit manufacturer's certification that vacuum, ventilation, and other equipment required to contain airborne asbestos fibers conform to ANSI Z9.2.

B. Asbestos Plan

1. Submit a detailed plan of the asbestos abatement work procedures to be used in removing the sheet flooring/mastic, floor tile/mastic, baseboard mastic, ceiling surface compound, and wallboard and joint compound, and asphalt roofing materials. Such plan shall include location of asbestos control areas, change rooms, decontamination procedures, layout of change rooms, interface of trades involved in the construction, sequencing of asbestos-related work, disposal plan, type of wetting agent, type of asbestos sealers to be used, air monitoring, and a detailed description of the method to be employed in order to control pollution. This plan must be approved by the Contracting Officer prior to the start of any asbestos work.

C. Testing Laboratory

1. Submit the name, address, and telephone number of the accredited testing laboratory selected for the monitoring of airborne concentrations of asbestos fibers along with certification that persons counting the samples are proficient by participation in the American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program. Timely scheduling of the laboratory analysis of samples is the responsibility of the Contractor.

D. Industrial Hygienist

1. Submit the name, address, and telephone number of the certified industrial hygienist selected to direct monitoring and training.

E. Monitoring Results

1. Fiber counting shall be completed and results reviewed by the industrial hygienist within 12 hours following sample collection. The industrial hygienist shall notify the Contractor and the Contracting Officer immediately of any exposures to asbestos fibers in excess of the acceptable limits. Submit all monitoring results to the Contracting Officer within 3 working days following sample collection.
2. A copy of all monitoring reports, including a description of the work procedure at the time of air monitoring, shall be submitted to the Contracting Officer.

F. Notification

1. Notify the Contracting Officer three working days prior to the start of asbestos work.

G. Landfill

1. Submit written evidence that the landfill is approved for asbestos disposal by the EPA and state or local regulatory agency(s). A log signed by the landfill operator must be maintained by the Contractor and submitted to the Contracting Officer on a weekly basis.

H. Local Exhaust System

1. Pressure differential recordings for each work day shall be reviewed by the industrial hygienist and submitted to the Contracting Officer within 24 hours. The industrial hygienist shall notify the Contractor and the Contracting Officer immediately of any variance in the pressure differential which could cause exposure of adjacent unsealed areas to asbestos fiber concentrations in excess of 0.1 fiber per cubic centimeter. The industrial hygienist shall notify the Contracting Officer of the governing criteria for pressure recordings.

I. Training

1. Submit certificates signed by each employee that the employee has received training in the proper handling of materials that contain asbestos; understands the health implications and risks involved, including the illnesses possible from exposure to airborne asbestos fibers; understands the use and limits of the respiratory equipment to be used; and understands the results of monitoring of airborne quantities of asbestos as related to health and respiratory equipment.

J. Notification of EPA

1. Notify in writing the EPA Regional Office and Montana Department of Environmental Quality of the proposed asbestos work, with copy to the Contracting Officer, at least 10 working days before work commences on this project.

K. Permits

1. Submit to the Contracting Officer for approval written proof that all required permits and arrangements for transport and disposal of asbestos-containing or contaminated materials, supplies, and the like at a site approved by EPA and other responsible agencies have been obtained.

L. Schedule and Sequence

1. Submit to the Contracting Officer for approval a written "work plan" satisfactory to the Contracting Officer describing the schedule for asbestos abatement, decontamination procedures and the plans for construction of decontamination enclosure systems and for isolation of the work areas in compliance with this specification and applicable regulations. The plan shall schedule the systematic flow of work throughout the facility on a day-by-day, unit by unit basis. It shall show if and when each unit will be off limits to its usual occupants. The Contractor must maintain close coordination of work with the Contracting Officer.

M. Respirator Program

1. Submit to the Contracting Officer for approval a written respirator program in compliance with all parts of CFR Title 29, Part 1910, Section 1910.1001 and CRF Title 29, Part 1926, Section 1926.1101.

N. Air Monitoring

1. Submit to the Contracting Officer for approval information pertaining to the proposed air monitoring program for this project. This program shall include the name(s) of the industrial hygienist, types of equipment, and sampling schedule sampling procedures, calibration recordkeeping, and testing laboratory.

O. Disposal Site Records

1. Three copies of written proof of disposal at approved disposal site are required to be submitted to the Contracting Officer prior to completion of the abatement work.

P. Occupancy Permit

1. Submit industrial hygienist's certification that the abatement area is asbestos-free within OSHA requirements and the work areas are safe for public occupancy in respect to asbestos exposure.

1.9 QUALITY CONTROL

- A. On site quality control is the responsibility of the Contractor as specified in Section 01400, Contractor Quality Control.
- B. Quality control for asbestos abatement operations includes, but is not limited to, observation regarding: integrity of the barrier; decontamination facilities and protective coverings; worker protection programs; the air monitoring program; performance of abatement measures including work area preparation and isolation; removal; encapsulation; patching; disposal; conformance with Federal, State, and local regulations.
- C. If the Contractor's Quality Control Program becomes ineffective and the Contracting Officer determines that practices are in violation of the applicable regulations, or are endangering workers or the facility occupants, the Contracting Officer will orally notify the Contractor to immediately cease operations until corrective action is taken. This stop work order will be confirmed in writing by the Contracting Officer. Any costs resulting from such a stop work order issued by the Contracting Officer will be borne by the Contractor and will not be a basis for an increase in the contract amount.
- D. Throughout the duration of the contract work, the safety of the Contractor's employees, Government employees, and the public is the sole responsibility of the Contractor.

1.10 TITLE TO MATERIALS

- A. All asbestos and asbestos-contaminated materials resulting from removal work, except as specified otherwise, shall become the property of the Contractor, as well as the Government, and shall be disposed of as specified.

1.11 PROTECTION OF EXISTING WORK TO REMAIN

- A. Perform removal work without damage or contamination to adjacent work. Where existing work is damaged or contaminated, it shall be restored to its original condition at no expense to Contracting Officer prior to start of restoration. The restorative procedures shall be approved by the Contracting Officer prior to start of restoration. Restoration, except for cleaning, does not apply to existing work which will be subsequently demolished.

1.12 MEDICAL REQUIREMENTS: 29 CFR 1910.1001/29 CFR 1926.1101

A. Examinations

1. Before exposure to airborne fibers, provide workers with a comprehensive medical examination as required by 29 CFR 1910.1001 and 29 CFR 1926.1101, as applicable. This examination is not required if adequate records show the employee has been examined as required by 29 CFR 1910.1001 or CFR 1926.1101 as applicable within the past year.

B. Medical Records

1. Maintain complete and accurate records of employees' medical examinations for 30 years after termination of employment and make records of the required medical examinations available for inspection and copying to: The Assistant Secretary of Labor of Occupational Safety and Health, an employee's physician upon the request of the employee or former employee, and any authorized Federal or state agency.

1.13 TRAINING

- A. Within 3 months prior to assignment to asbestos work, instruct each employee on the hazards of asbestos, safety and health precautions, and the use and requirements for protective clothing and equipment including respirators. Fully cover hazard control techniques and procedures.

B. Employee Certification

1. Where required by state or local law, all employees shall have valid asbestos worker certification applicable to the level of work or responsibility for which the employee is assigned. Current accreditation by the EPA and State of Montana is required for all individuals performing asbestos work on this project.

1.14 PERMITS AND NOTIFICATIONS

- A. Secure necessary permits for asbestos removal, hauling (where required), and disposition and provide timely notification of such actions as may be required by Federal, State, Regional, and local authorities. Notify the Regional Office of the Environmental Protection Agency (EPA) in accordance with 40 CFR 61.145 (b) and provide copies of the notification to the Contracting Officer and the State Environmental Regulatory Agency at least 10 working days prior to commencement of the work.

1. Send written notification as required by USEPA National Emission Standards for Hazardous Air Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M) to the regional Asbestos NESHAP Contact at least 10 working days prior to beginning any work on asbestos-containing materials. Send notification to the following address:

Asbestos Control Program  
Montana Department of Environmental Quality  
1520 East 6th Avenue  
P.O. Box 200901-0901  
Helena, Montana 59620  
(406) 444-3490

1.15 SAFETY COMPLIANCE

- A. In addition to detailed requirements of this specification, comply with administrative codes, laws, ordinances, rules, and regulations of Federal, state, regional, and local authorities regarding work procedures for asbestos including but not limited to handling, storing, transporting, and disposing of asbestos waste materials. Comply with current requirements of 29 CFR 1910.1001, 29 CFR 1962.1101 and 40 CFR 61, Subparts A and M, as applicable. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where requirements vary between administrative codes, laws, ordinances, rules, and regulations, the stricter requirement shall apply unless specifically stated in Paragraph 1.01, DESCRIPTION OF WORK.

1.16 RESPIRATORY PROGRAM

- A. Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134.

1.17 SANITARY FACILITIES

- A. Adequate toilet facilities shall be provided for the duration of the project. Where such facilities do not exist, the Contractor shall provide portable service.

1.18 DELIVERY, STORAGE AND PROTECTION

A. Delivery

- 1. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

B. Storage

- 1. Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover to prevent damage or contamination.

C. Protection

- 1. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Materials that become contaminated with asbestos shall be disposed of in accordance with the applicable requirements.

PART 2 - PRODUCTS

2.1 RESPIRATORS

A. Selection

- 1. Select respirators from those approved by the Mine Safety and Health Administration (MSHA), Department of Labor, or the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

B. Respirators for Handling Asbestos

- 1. Provide personnel engaged in the removal of asbestos materials with approved respiratory protection.

C. Optional Respirators for Handling Asbestos

- 1. Use Type "C" continuous flow or pressure-demand supplied-air respirators until the Contractor establishes that the average airborne concentrations of asbestos the employees will confront will not exceed 100 times the permissible exposure limits; i.e. 8-hour time-weighted average (TWA). When the exposure limits are established the respirators in 29 CFR 1910.1001 that afford adequate protection at the upper concentrations of airborne asbestos may be used. If the Contractor decides to provide respirators other than a Type "C" continuous flow or pressure-demand supplied-air respirator, the Contractor shall determine the exposure of each employee to airborne asbestos during each type of removal operation. Determine both the ceiling limit and the 8-hour TWA concentration of asbestos to which each of the employees is exposed during each type of removal operation.

## 2.2 ENCAPSULANTS

- A. Encapsulants shall be of the bridging or penetrating variety and shall meet standards set by the EPA for asbestos encapsulants and be certified by Battelle Laboratory in Columbia, Ohio, as meeting those standards. Contractor shall verify the compatibility of the encapsulant with the project materials and conditions. Encapsulant products include:
1. Type 22-P", American Coatings Corp., 3037 NW 60<sup>th</sup>, Fort Lauderdale, FL 33309.
  2. Certane 1000", Certech, 1624 Harmon Pl., Suite 209, Minneapolis, MN 55403.
  3. "CP-240", Childers Products Co., Inc., 2061 Hartel St., Levittown, PA 19057.
  4. "FiberSeal" Eppert Asbestos Abatement, 9100 Freeland Ave., Detroit, MI 48228.
  5. "Type 32-60 or 32-61", H.B. Fuller Co., 1200 Wolters Blvd., Vadnais Heights, MN 55110.
  6. "Serpiloc or Lock-It", International Protective Coatings, Corp., 725 Carol Ave., Ocean, NJ 07712.
  7. Any encapsulant meeting standards set by the EPA for asbestos encapsulation and certified by Battelle Laboratory in Columbus, Ohio, as meeting those standards.

## 2.3 PLASTIC SHEETING

- A. Plastic sheeting shall be polyethylene material sized in lengths and widths to minimize the frequency of joints. Where a potential for fire exists, flame-resistant polyethylene material shall be provided. Flame-resistant polyethylene sheeting shall be frosted and shall conform to the requirements of NFPA 701. The minimum thickness shall be as follows:

1. Surface	Minimum Application Thickness
2. Wall Barriers	two layers of 4 mil
3. Floor Barriers	two layers of 6 mil
4. Critical Barriers	two layers of 6 mil
5. All Others	4 mil

## 2.4 PLASTIC BAGS

- A. Plastic bags shall be minimum 6 mil polyethylene printed with warning labels per OSHA and EPA guidelines.

## 2.5 TAPE

- A. Tape shall be capable of sealing joints of adjacent plastic sheets and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials and of adhering under dry and wet conditions, including use of amended water.

## 2.6 GLOVE BAGS

- A. Glove bags shall be a minimum of 6 mil polyethylene for work performed in unoccupied areas, and 12 mil polyethylene for work performed in occupied areas or at heights 15 feet above a surface. Surfaces under a glove bag operation shall be protected with plastic sheeting. Glove bags shall be specially designed for removal of asbestos-bearing insulation and shall bear asbestos warning labels.

## 2.7 EYE PROTECTION

- A. Provide goggles or other approved eye protection to personnel engaged in asbestos operations.

2.8 SPECIAL CLOTHING

A. Protective Clothing

1. Provide personnel exposed to airborne concentrations of asbestos fibers with fire retardant disposable protective whole body clothing, head coverings, gloves, and foot coverings. Provide disposable plastic or rubber gloves. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone. Make sleeves secure at the wrists and foot coverings secure at the ankles with tape.

2.9 WARNING SIGNS

- A. Provide warning signs at all approaches to asbestos control areas containing concentrations of airborne asbestos fibers. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area.

- B. Warning signs shall have a vertical format conforming to 29 CFR 1910.1001, 29 CFR 1926.1101 and 29 CFR 1910.145(d) (2), minimum 20 by 14 inches displaying the following legend in the lower panel:

1.	Legend	Notation
2.	Danger Block	3 inch Sans Serif Gothic or
3.	Asbestos Block	1 inch Sans Serif Gothic or
4.	Cancer and Lung Disease Hazard	1 inch Gothic
5.	Authorized Personnel Only	1 inch Gothic
6.	Respirators and Protective Clothing are Required in this Area	1 inch Gothic

- C. Spacing between lines shall be at least equal to the height of the upper of any two lines.

2.10 WARNING LABELS

- A. Provide labels and affix to all asbestos materials, scrap, waste, debris, and other products contaminated with asbestos.

- B. Provide labels of sufficient size to be clearly legible, displaying the following legend:

DANGER  
CONTAINS ASBESTOS FIBERS  
AVOID CREATING DUST  
CANCER AND LUNG DISEASE HAZARD

2.11 SURFACTANT (WETTING AGENT)

- A. Surfactant shall consist of mixture of "Dust-Set Amended Water Base" (Matheson Chemical Corporation) and water, or equivalent and water, or 50 percent polyoxythelene ether/50 percent polyethylene ester and water, mixed to manufacturer's specifications to produce amended water.

2.12 CASSETTES FOR AIR MONITORING

- A. Reloaded cassettes shall not be used for air monitoring. All cassettes shall be new. Cassettes shall be received on site packaged in original containers with pertinent manufacturer's literature visible and records of purchase orders and identifying data kept on site.

2.13 OTHER MATERIALS

- A. The Contractor shall provide standard commercial quality of all other materials such as lumber, nails, and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area, and to complete the work.

2.14 TOOLS AND EQUIPMENT

- A. Water sprayer for amended water application shall be an airless or other low pressure type.
- B. Airless sprayer, suitable for application of encapsulating material, shall be used.
- C. Local Exhaust System
  - 1. Provide a local exhaust system in the asbestos control area in accordance with ANSI Z9.2. Equip exhaust with absolute (HEPA) filters (99.97). Local exhaust equipment must maintain a minimum pressure differential of minus 0.02 inch of water column relative to adjacent, unsealed areas. Provide continuous 24-hour per day monitoring of the pressure differential with an automatic recording instrument. In no case shall the building ventilation system be used as the local exhaust system for the asbestos control area. Filters on exhaust equipment shall conform to ANSI Z9.2.
  - 2. Air purifying equipment shall consist of HEPA filter systems. No air movement system or air equipment shall discharge asbestos fibers outside the work area. The equipment shall be capable of at least 1700 CFM under load (for 2000 CFM rated machines) and shall have at least 2 stages of pre-filtration ahead of the HEPA final filter. It shall be equipped with an elapsed time indicator (hour meter), static pressure gauge with low flow alarm, and be overload protected. The unit shall be a Micro-Trap Portable Air Filtration System manufactured by Asbestos Control Technology, Inc., or an approved equivalent.
- D. Vacuum equipment utilized in the work area shall use HEPA filters on the discharge and shall be suitable for use both wet and dry. Filters on vacuum equipment shall conform to ANSI Z9.2.
- E. Scaffolding to accomplish the specified work, shall meet all applicable safety regulations.
- F. Transportation equipment, as required, shall be suitable for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property.
- G. Other Tools and Equipment: The Contractor shall provide other suitable tools for the removal, enclosure, encapsulation, patching, and disposal activities, including hand-held scrapers, wire brushes, sponges, and rounded edge shovels.
- H. Electrical tools and equipment shall meet all applicable codes and regulations. Ground fault protection or assured grounding programs, as required by OSHA, shall be in effect at all times. Contractor to take all additional precautions and measures to insure a safe working environment during wet removal.

PART 3 - EXECUTION

3.1 WORK PROCEDURE

- A. Perform asbestos-related work in accordance with 29 CFR 1910.1001 or 29 CFR 1926.1101 and local, state or federal regulations, as applicable, and as specified herein and in the contract specifications and drawings. Use wet removal procedures. The abatement work involving Class I, II III and IV work as defined in 1926.1101, and all requirements for those work classes apply to work of this project. Personnel shall wear and utilize protective clothing and equipment. Eating, smoking, or drinking shall not be permitted in the asbestos control area. Personnel of other trades not engaged in the removal of asbestos shall not be exposed at any time to airborne concentrations of asbestos unless all the personnel protection provisions of this

specification are complied with by the trade personnel. Shut off all air-conditioning and building ventilating systems to the abatement area. Disconnect electrical service when wet removal is performed and provide temporary electrical service.

### 3.2 ASBESTOS CONTROL AREA, CLOSED

- A. An enclosed asbestos control area shall be used for the removal of friable surfacing ACM, friable TSI, other friable ACM and non-friable ACM likely to become friable during removal. Seal openings in areas where the release of airborne asbestos fibers is expected. Establish an asbestos control area by the use of curtains, portable partitions, or other enclosures to prevent the escape of asbestos fibers from the contaminated asbestos control area. In all instances, control area development shall include protective covering of walls, and floors and ceilings, as applicable, with a continuous membrane of two layers of plastic sheeting sealed with adhesive spray and tape to prevent water or other damage. Openings such as windows, doors, ducts, etc. which are not to be used for air inlets or HEPA filtered outlets shall be covered with two layers of plastic sheeting. Provide two layers of plastic sheeting over floors and extend a minimum of 12-inches up walls. Seal all joints with tape. Provide a local exhaust system in the asbestos control area. Openings will be allowed in enclosures of asbestos control areas for the supply and exhaust of air for the local exhaust system. Replace filters as required to maintain the efficiency of the system.

### 3.3 ASBESTOS CONTROL AREA, OPEN

- A. The construction of an enclosed asbestos control area may be impractical for the removal of cement asbestos board panels, siding or shingles or asphalt roofing materials located on the exterior of the buildings or for non-friable removal of sheet flooring/mastic or floor tile/mastic. These materials are typically classified as NESHAP Category I and II, non-friable ACM. Employ recognized methods for removal of non-friable materials and comply with regulations pertinent to personal air monitoring and disposal. Establish designated limits for the asbestos work area and with the use of asbestos warning tape or other continuous barriers, barricade the designated area from non-asbestos workers. Maintain all other requirements associated with removal and disposal of asbestos as applicable. Also, where an enclosure is not provided, conduct area monitoring of airborne asbestos fibers during the work shift at the designated limits downwind of the asbestos work area at such frequency as recommended by the industrial hygienist. If the quantity of airborne asbestos fibers monitored at the designated limits at any time reaches the time weighted average maximum specified for non-asbestos workers evacuated personnel in adjacent areas or provide personnel with approved protective equipment. If adjacent areas are contaminated, clean the contaminated areas, monitor, and visually inspect the area as specified herein. Decontamination procedures shall allow HEPA vacuuming of workers in lieu of a shower area.

### 3.4 DECONTAMINATION AREA

- A. Decontamination room shall provide a storage area for workers clothes which are used in the control area.
- B. Clean room shall contain storage for the workers street clothes and other uncontaminated items.
- C. Shower room shall be between the decontamination room and the clean room. The shower shall be provided with warm water, soap, and a means of personnel drying.
- D. Waste Load Out
  - 1. Where negative pressure enclosures are utilized as an engineering control, and where feasible, a two chamber air lock, adjacent and connected to the negative pressure enclosure, shall be constructed for the decontamination and removal of asbestos.

3.5 ACCESS TO WORK AREAS

- A. Make available to the Contracting Officer two complete sets of personnel protective equipment for entry to the asbestos control area at all times for inspection.
- B. Access to Isolated Work Area by Others.
  - 1. Except for emergency, regulatory and Contractor's authorized personnel, the Contractor shall limit access to the work area to representatives of the Contracting Officer.
  - 2. The Contractor shall provide dress and equipment for all authorized visitors.

3.6 AIR MONITORING

- A. General
  - 1. Monitoring of airborne concentrations of asbestos fibers shall be in accordance with 29 CFR 1910.1001 and 29 CFR 1926.1101 and as specified herein.
- B. Review
  - 1. Personnel and procedures utilized by the Contractor are subject to review of the Contracting Officer. All air monitoring shall be performed by qualified monitoring personnel under supervision of the certified industrial hygienist.
- C. Records
  - 1. Documentation shall be kept for each filter sample procured as to worker sampled, work area locations, date and time taken, volume of air drawn through filter, pump identification number, and calibration. Documentation shall indicate whether tests were taken in isolated work areas, in glove bag work areas, in occupied public spaces, etc.
- D. Samples
  - 1. The samples shall be forwarded to an independent testing laboratory, approved by the Contracting Officer, for analysis. The laboratory analyst shall sign and submit permanent records of all samples analyzed to the Contracting Officer. Unused portions of the sample shall be returned to the Contracting Officer with the sample records. Each sample must be positively contained, labeled as to location, results of analysis, date, laboratory, and project.
  - 2. Monitoring Prior to Asbestos Work: Provide area monitoring and establish the reference TWA 1-day prior to work area preparation operations for each work site.
  - 3. Monitoring During Asbestos Work: Provide personal monitoring and area monitoring during abatement operations.
  - 4. Monitoring Following Asbestos Work: Provide clearance monitoring following abatement work in each area.
  - 5. Pre-Abatement Air Sampling: A minimum of 1 air sample inside each work area and 1 air sample outside each work area shall be taken prior to commencing work in that area. Minimum sample volume shall be 480 liters.
  - 6. Abatement Air Sampling: A minimum of 1 air sample inside each work area, 1 sample in the decontamination area, 1 air sample at the negative air exhaust and 1 air sample

outside each work area shall be taken during abatement work in that area. Minimum area sample volume shall be 240 liters.

7. Clearance Air Sampling: A minimum of 1 air sample inside each work area and 1 air sample outside each work area shall be taken after abatement is completed in that area. Minimum sample volume shall be 1,500 liters.
8. Pre-Abatement Testing and Clearance Testing: Air samples shall be taken before and after abatement projects to determine airborne levels of asbestos. Airborne asbestos levels analyzed after the abatement work is completed shall not exceed those found before initiating of the project or 0.01 fibers per cubic centimeter (f/cc) (for any sample) whichever is less. These levels shall be met before cleanup will be considered complete. In occupational environments where the pre-test level exceeds 0.01 f/cc, waivers may be granted by the Contracting Officer, depending on the type and level of occupancy in the area, allowing higher cleanup levels but in no case will they be allowed to exceed a time weighted average (TWA) of 0.1 f/cc, the OSHA PEL. The Contracting Officer may waive the requirement for aggressive air sampling if it can cause a more serious exposure problem or over estimation of the hazard since all fibers collected and analyzed by phase contrast microscopy are counted as asbestos. Pre-abatement and clearance air samples must be taken using the same procedures.

E. Equipment

1. The Contractor shall furnish and maintain all monitoring equipment required. The Contractor shall show proof of proper pump operation and calibration as requested by the Contracting Officer. The Contractor shall bear all costs of air monitoring, testing, and reporting required.
2. Results of all air monitoring shall be made available to the Contracting Officer within 48 hours of sampling.

- F. If the results of the air monitoring in any isolated work area indicate an asbestos fiber concentration above the level of protection afforded by the respirators in use, as defined in 29 CFR 1910.1001 for asbestos workers, or if the results outside of that area indicate a fiber concentration above 0.01 f/cc, all abatement work in that area shall stop. These samples shall then be re-tested. If the results of phased contrast light microscopy analysis exceed the above limits, the Contractor will initiate additional air and surface cleaning procedures to reduce fiber concentration below these limits. The Contractor may resume abatement work in that area only after he receives written authorization from the Contracting Officer. Any costs resulting from high air sampling results shall be borne by the Contractor and will not be a basis for an increase in the contract amount.

G. Sampling Frequency

1. Sampling During Abatement in Isolated Work Areas:
  - a. Air monitoring will provide the following samples during the period of asbestos abatement in each work area. Begin sampling when asbestos removal commences, with samples in each of the five following categories taken at least once during each 24-hour period unit abatement is complete in that work area.
  - b. The industrial hygienist and Contractor shall determine which worker in each work area is probably experiencing the most severe exposure.
  - c. These are the "Most Contaminated Worker" samples referred to in the table below. This worker shall wear a personal sampling pump and the sample shall be drawn from the breathing zone of this worker. All other samples are area samples.

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Area/Person To Be Sampled	Minimum Of Samples	Number	Minimum Sample Volume
Most Contaminated Worker (Excursion Limit)	1		10 liters
Most Contaminated Worker (8-hr TWA)	1		240 liters
Work Area	1		240 liters
Outside Work Area	1		480 liters
Decontamination Area	1		480 liters
HEPA Fan Exhaust	1		480 liters

3.7 ASBESTOS HANDLING PROCEDURES:

A. Asbestos Removal

1. Sufficiently wet asbestos material with a fine spray of amended water during removal, cutting, or other handling to reduce the emission of airborne fibers. Remove material and immediately place in plastic disposal bags. Where unusual circumstances prohibit the use of plastic bags, submit an alternate proposal for containment of asbestos fibers to the Contracting Officer for approval. For example, where both the asbestos material and substrate are to be removed, the Contractor may elect to wet the asbestos material, wrap the asbestos material and substrate in plastic, and remove the material and substrate intact.

B. Cleaning of Asbestos-Contaminated Items for Disposal

1. Clean contaminated architectural, mechanical, and electrical appurtenances such as venetian blinds, full-height partitions, carpeting, ductwork, pipes and fittings, radiators, light fixtures, conduit, panels, and other contaminated items designated for removal by completely wet cleaning or HEPA-vacuuming the items before removing the items from the asbestos control area.

3.8 DISPOSAL

- A. The Contractor shall determine current waste handling, transportation, and disposal regulations for the work site and the waste disposal landfill. Contractor shall comply fully with these regulations and all U.S. Department of Transportation (DOT) and EPA requirements. Label and all signs shall be in accordance with DOT, EPA and OSHA standards.

3.9 PROCEDURAL OUTLINES

- A. The following procedure and sequence descriptions are a guide in preparation of detailed ASBESTOS PLAN and SCHEDULES required for submittal and approval prior to start of work in the asbestos abatement area. The outlines are not complete or detailed in procedure but are sufficient to be used as a guide.

1. Isolated Work Area
  - a. Work Area Preparation: The following isolation procedures shall be performed in the order in which they are presented.
  - b. Shut down, remove filters, and isolate Heating, Ventilation, & Air Conditioning (HVAC) systems to prevent further contamination and fiber dispersal. Coordinate with the Contracting Officer prior to shut down. Contractor shall maintain heat in the project facilities during cold weather. At no time should the temperature in any room of the building fall below 55 degrees F, and during occupied periods the temperature should be maintained at a minimum of 65 degrees F.

- c. Set up the worker decontamination enclosure system. Once these systems are installed, they shall be utilized in the specified manner for the ingress and egress of all personnel and equipment, except in emergency situations.
  - d. Coordinate all electrical service connections, requirements, and equipment with the Contracting Officer.
  - e. Seal off all openings including doorways, windows, and other penetrations of the work area with plastic sheeting sealed with tape, except openings left for HEPA air purification system, which must be properly HEPA filtered.
  - f. Install HEPA air purifying equipment/negative pressure fan system to insure lower static pressure in the isolated work area than in surrounding areas, a flow of air through all parts of the isolated work area towards the air purifying equipment, and minimum air contamination levels at abatement worker breathing zones. Discharge from air purifying equipment shall be ducted outside the building. Use one or more units of capacity as recommended by the manufacturer for the volume of the isolated work area, but in no case shall air flow be less than one air change every 15 minutes.
  - g. Pre-clean movable objects (and carpeting) within the work area using HEPA filtered vacuum equipment and wet cleaning methods and enclose with minimum 4 mil plastic sheeting sealed with tape.
  - h. Pre-clean fixed objects within the work areas, using HEPA filter vacuum equipment and/or wet cleaning methods, and enclose with minimum 4 mil plastic sheeting sealed with tape.
  - i. Cover floor and wall surfaces with plastic sheeting sealed with tape. Cover floors first so that plastic extends at least 12 inches up on walls, then cover walls and plastic sheeting to the floor level.
  - j. Maintain emergency and fire exits from the work areas, or establish alternative exits satisfactory to the local building or fire department officials. Coordinate with Government Inspector.
  - k. Adequate portable fire extinguishing equipment shall be maintained within work area as defined by OSHA and/or local fire department officials.
2. Isolated Work Area Enclosure System Maintenance
- a. Ensure that barriers and plastic linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.
  - b. Visually inspect enclosure at the beginning of each work period.
  - c. Use smoke methods or an equivalent method to test effectiveness of barriers.
  - d. When required, a bag holding and decontamination chamber will be constructed as a transition area.
  - e. Inspect HEPA air purification system before and during use.

B. Worker Protection

1. Change Rooms

- a. Provide a temporary unit with a separate decontamination locker room and a clean locker room for personnel required to wear whole body protective clothing. Provide two separate lockers for each asbestos worker, one in each locker room. Keep street clothing and shoes in the clean locker. Vacuum and remove asbestos-contaminated disposable protective clothing while still wearing respirators at the boundary of the asbestos work area and seal in impermeable bags or containers for disposal. Do not remove disposal clothing in the decontamination locker room. Remove cloth work clothing in the decontamination room. Tag and bag cloth work clothes for laundering and keep work shoes in the decontamination lockers. Do not wear work clothing between home and work. Locate showers between the decontamination locker room and the clean locker room and require that all employees shower before changing in accordance with 29 CFR 1910.1001 and 29

CFR 1926.1101. No asbestos abatement work shall occur unless this decontamination system is functional.

2. Each worker shall, upon entering the job site, remove street clothes in the clean change room and put on a respirator and clean protective clothing before entering the equipment room or the work area, except the workers intending to wear contaminated protective clothing stored in the equipment room shall enter equipment room wearing only respirators.
3. Workers shall, each time they leave the work area, remove gross contamination from clothing by vacuuming before leaving the work area; proceed to the equipment room and remove all clothing except respirators; still wearing the respirator proceed naked to the showers; clean the outside of the respirator with soap and water while showering; remove the respirator; thoroughly shampoo and wash themselves; remove filters, dispose of filters in the container provided for the purpose; and wash and rinse the inside of the respirator.
4. Following showering and drying off, each worker shall proceed directly to the clean change room and dress in clean clothes at the end of each day's work, or before eating, smoking, or drinking. Before reentering the work area from the clean change room, each worker shall put on a clean respirator with filters and shall dress in clean protective clothing stored in the equipment room or shall enter the equipment room wearing only respirators.
5. Contaminated work footwear shall be stored in the equipment room when not in use in the work area. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean inside and out using soap and water before removing from work area.
6. Workers shall not eat, drink smoke, or chew gum or tobacco at the worksite except in the established clean room. Smoking is prohibited due to explosion and fire hazard.
7. Workers shall be protected with respirators and protective clothing prior to the first disturbance of asbestos-containing or contaminated material and until final cleanup is completed.

C. Removal of Asbestos-Containing Materials in Isolated Work Areas:

1. Isolate work areas.
2. The asbestos material will be sprayed with water containing an additive to enhance penetration. The additive, or wetting agent, will be consistent with the manufacturer's recommendations. A fine spray of this solution must be applied to prevent fiber disturbance preceding the removal of the asbestos material. The asbestos will be sufficiently saturated to minimize emission of airborne fibers.
3. Removal of the asbestos material will be done in small sections with two-person teams, on staging platforms if needed. Remove loose or hanging asbestos material while damp and pack in sealable plastic bags (6 mil minimum thickness ) and place in labeled containers.
4. After completion of stripping work, all surfaces from which asbestos has been removed shall be wire brushed and/or wet sponged or cleaned by an equivalent method to remove all visible material. The surfaces being cleaned shall be kept wet. Asbestos will be bagged and stored in bag holding enclosure prior to end of that shift.
5. After completion of wire brush cleaning above and prior to the removal of barriers and plastic lining, apply a single "tack coat" of penetrating encapsulant as a post-removal encapsulant. All surfaces having asbestos removed from them, except flooring areas where new flooring will be installed, shall receive a post-removal encapsulant coating. Encapsulant application shall follow manufacturer's recommendations.

6. Cleanup shall be in accordance with approved procedures.

D. Removal of Asbestos-Containing Materials Using Glove Bag Methods

1. Completely pre-clean entire work area using HEPA vacuum or wet cleaning methods.
2. All removal using the glove bag method shall be performed according to OSHA requirements and manufacturer's printed instructions and as demonstrated by the manufacturer's representative. Use negative pressure glove bags if more than one glove bag is used per room outside a negative pressure enclosure area.
3. Workers are not to smoke or wear hand or wrist jewelry while using glove bags.
4. Shut off all sources of heat to pipes to be worked on. Do not work on pipes above 150 degrees F.
5. Promptly remove all bags, as they are used, to the bag holding decontamination enclosure system.
6. After completion of insulation removal and cleaning, but prior to removal of glove bag, apply a single "tack coat" of penetrating encapsulant to surface of pipe and any remaining non-asbestos insulation.
7. Personnel Protection During Glove Bag Removal:
  - a. Perform glove bag removal in occupied rooms only with written permission of the Contracting Officer. Glove bags are never to be used directly above occupants of rooms.
  - b. Perform all glove bag removal above drop cloths.
  - c. Each worker performing glove bag removal is to have emergency control and cleanup equipment including: Respirator and Protective Clothing; HEPA Vacuum; Amended Water; Disposal Bags; Mops, Sponges, Rags, Additional Drop Clothes, Etc.
  - d. Each worker to be trained in use of Asbestos Warning Signs during removal activities and emergency cleanup.

E. Removal of Non-Friable Cement Asbestos Boards or Shingles or Asphalt Roofing Materials from Exterior Areas

1. Cement asbestos boards and/or shingles, and asphalt roofing materials shall be carefully removed, avoiding unnecessary breakage. Where specifically indicated, and due to the non-friable condition of the material, certain exceptions to regulations regarding handling and disposal techniques will be allowed providing that detailed submissions of proposed procedures are submitted to all applicable agencies and are approved. As an example, when approved by local authorities disposal may be done in bulk rather than by double bagging smaller quantities. Transportation procedures, however, must be absolutely secure and preclude disturbance of the material which would cause release of fibers.

F. Cleanup in Isolated Work Areas:

1. Remove visible accumulations of asbestos material and debris (including filters removed from HVAC equipment and HEPA air purification equipment). Wet clean all surfaces within the work areas.
2. Sealed drums and all equipment used in the work area shall be included in the cleanup and shall be removed from work area, after decontamination of outer surfaces.
3. Remove the plastic sheets from walls and floors only. The windows, doors, and HVAC vents shall remain sealed and HEPA filtered negative air pressure systems shall remain in service.
4. Clean all surfaces in the work area and any other contaminated areas with water and with HEPA filtered vacuum equipment. After cleaning the work area, wait 24 hours to allow for settlement of dust, and again wet clean or clean with HEPA filtered vacuum equipment all surfaces in the work area. After completion of the second cleaning operation, perform a visual inspection to ensure that the work area is free of visible asbestos debris. During this settling period, no entry, activity, or ventilation will be allowed.
5. Post-abatement air sampling shall be taken within 24 hours of final cleaning.

6. When the final inspection by the Contracting Officer or his representative and air sampling test results are satisfactory, the decontamination systems and remaining barriers shall be removed.
7. All polyethylene material, tape, cleaning material, and contaminated clothing will be placed in plastic-lined drums, sealed and labeled for asbestos waste material. Affix a caution label to each bag.
8. Upon completion of asbestos abatement activities in an isolated work area, the wall and floor coverings will be removed and the work area cleaned twice. Prior to dismantling the decontamination enclosure systems, clearance air monitoring will be done inside and outside the work area. Sample volumes will be 1,500 liters minimum. If the sample exceeds the allowable f/cc limit, the area will be re-cleaned and re-tested or electron microscopy will be used to verify the cleaning requirement. Air and surface cleaning of the work area will continue until air sampling results fall below the requirements specified. The Contractor's certified industrial hygienist will certify the work area safe for public occupancy upon completion and cleanup of the project to the specified levels. This certificate shall be submitted to the Contracting Officer.
9. Before cleanup is considered complete, all evidence of visible asbestos dust shall be removed from the work area and surroundings. Final review will be completed by the Contracting Officer or his representative.

### **CERTIFICATION OF FINAL CLEANING AND VISUAL INSPECTION**

Individual abatement task as identified in paragraph DESCRIPTION OF WORK

\_\_\_\_\_  
In accordance with the clearing and decontamination procedures specified in the Contractor's asbestos hazard abatement plan and this contract, the Contractor hereby certifies that he/she has thoroughly visually inspected the decontaminated regulated work area (all surfaces, including pipes, beams, ledges, walls, ceiling, floor, decontamination unit, etc.) and has found no dust, debris, or asbestos-containing material residue.

BY: (Contractor's signature)

Date

\_\_\_\_\_  
Print Name and Title

(Contractor's Onsite Supervisor Signature)

Date

\_\_\_\_\_  
Print Name and Title

(Contractor's Competent Person Signature)

Date

\_\_\_\_\_  
Print Name and Title

(Contractor's Certified Industrial Hygienist Signature)

Date

\_\_\_\_\_  
Print Name and Title

### **CONTRACTING OFFICER ACCEPTANCE OR REJECTION**

The Contracting Officer hereby determines that the Contractor has performed final cleaning and visual inspection of the decontaminated regulated work area (all surfaces including pipes, beams, ledges, walls, ceiling, floor, decontamination unit, etc.) and by quality assurance inspection, finds the Contractor's final cleaning to be:

\_\_\_\_ Acceptable

\_\_\_\_ Unacceptable, Contractor instructed to reclean the Asbestos control work area.

BY: Contracting Officer's Representative

Signature

Date

\_\_\_\_\_  
Print Name and Title

END OF SECTION

## SECTION 02090 – LEAD-BASED PAINT (LBP) ABATEMENT AND DISPOSAL

### PART 1 - GENERAL

#### 1.1 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

#### 1. CODE OF FEDERAL REGULATIONS (CFR)

- a. 29 CFR Part 1910 Occupational Safety and Health Standards
- b. 29 CFR Part 1926 Safety and Health Regulations for Construction
- c. 40 CFR Part 148 Hazardous Waste Injection Restrictions
- d. 40 CFR Part 260 Hazardous Waste Management System: General
- e. 40 CFR Part 261 Identification and Listing of Hazardous Waste
- f. 40 CFR Part 262 Standards Applicable to Generators of Hazardous Waste
- g. 40 CFR Part 263 Standards Applicable to Transporters of Hazardous Waste
- h. 40 CFR Part 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
- i. 40 CFR Part 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
- j. 40 CFR Part 268 Land Disposal Restrictions
- k. 49 CFR Part 172 Hazardous Material Table, Special Provisions, Hazardous Material Communications, Emergency Response Information, and Training Requirements
- l. 49 CFR Part 178 Specifications for Packaging

#### 2. U.S. Department of Housing and Urban Development (HUD)

- a. HUD-006700 Guidelines for the Evaluation and Control of Lead-Based Paint in Housing

#### 3. ENGINEERING MANUALS

- a. EM 385-1-1 (1992) U.S. Army Corps of Engineers Safety and Health Requirements Manual

#### 4. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- a. NFPA 701 (1989) Methods of Fire Test for Flame-Resistant Textiles and Films
- b. NIOSH OSHA Lead in Construction Booklet 3142

#### 5. UNDERWRITERS LABORATORIES (UL)

- a. UL 586 (1990) High-Efficiency, Particulate, Air Filter Units

#### 1.2 DEFINITIONS

- A. The following definitions apply to work of this section.

1. Abatement - the elimination of exposure to lead-containing substances that may result in lead toxicity or poisoning by the removal, encapsulation, or enclosure of lead-containing substances, by thorough cleanup procedures, and by post-cleanup treatment of surfaces.
2. Air Monitoring - the process of measuring the lead content of a specific volume of air during a stated period of time.
3. ANSI - American National Standards Institute.
4. ASTM - American Society for Testing and Materials.
5. Clean Room - an uncontaminated area of room which is part of the worker decontamination enclosure system, with provisions for storage of workers' street clothes and protective equipment. Also known as the "Change Room."
6. Cleaning Solution - TSP detergent and hot water mixed according to the manufacturer's recommendations.
7. Contracting Officer - The authorized representative of the Government.
8. Decontamination Enclosure System - a series of connected rooms, with curtained doorways between any two adjacent rooms, for the decontamination of workers or of materials and equipment.
9. Encapsulation - to resurface or cover surfaces and to seal or caulk seams with durable material, so as to prevent or control chalking, flaking lead-containing substances from being reduced to dust.
10. Enclosure - procedures necessary to completely enclose material containing lead-containing substances behind airtight, impermeable, permanent barriers.
11. EPA - United States Environmental Protection Agency.
12. Equipment Decontamination Enclosure System - a decontamination enclosure system for materials and equipment.
13. Fixed Object (Immoveable object) - a unit of equipment or furniture in the work area which cannot be removed from the work area.
14. HEPA Filter - a High Efficiency Particulate Absolute (HEPA) filter capable of trapping and retaining at least 99.97 percent of all monodispersed particles 0.3 microns in diameter or larger.
15. HEPA Vacuum Equipment - vacuuming equipment equipped with a HEPA-filtration system.
16. Lead Abatement Project - any work performed in order to abate the presence of a lead-containing substance.
17. Lead-Based Paint (LBP) - any paint coating material containing more than 0.5 percent lead by weight calculated as lead metal in the dried solid, or more than 1.0 milligrams per square centimeter by X-ray fluorescence.
18. Lead-Containing Substance - any paint, plaster or other surface coating material containing more than 0.5 percent lead by weight calculated as lead metal in the dried solid, or more than 1.0 milligrams per square centimeter by X-ray fluorescence.
19. Movable Object - a unit of equipment or furniture in the work area which can be removed from the work area.
20. MSHA - Mine Safety and Health Administration.
21. NEC - National Electrical Code.
22. NIOSH - National Institute for Occupational Safety and Health.
23. OSHA - Occupational Safety and Health Administration.
24. Plastic Sheeting - plastic sheet material of specified thickness used for protection of walls, floors, etc., and used to seal openings into the work area.
25. Removal - the act of removing lead-containing or contaminated materials from the structure under properly controlled conditions to a suitable disposal site.
26. TCLP - EPA Toxic Characteristic Leaching Procedure (TCLP) for determining the toxicity characteristics of waste materials.
27. TSP - Tri-Sodium Phosphate.
28. Wet Cleaning - the process of eliminating lead contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with cleaning solution, disposing of these cleaning tools as lead waste.

- 29. Work Area - area or areas of Project which undergo abatement or are contaminated.
- 30. Worker Decontamination Enclosure System - a decontamination enclosure system for workers.

### 1.3 SUBMITTALS

- A. The following items shall be submitted, for government approval, in accordance with Section 01300 SUBMITTAL DESCRIPTIONS.
- B. Statements
  - 1. Lead-Based Paint (LBP) Management Plan - The Contractor shall review the specified abatement work tasks and abatement methods and shall prepare a detailed LBP Management Plan that identifies the work procedures, health, and safety measures to be used in LBP abatement. The plan shall address the various sources of lead and the methods to be undertaken to abate the lead hazards to include the following key elements:
    - a. Location of LBP containing components keyed to project drawings.
    - b. Abatement methods for each LBP containing component.
    - c. Means for notifying occupants of proposed work schedules.
    - d. Training requirements as required by Federal, state, and local regulations.
    - e. Unique problems associated with the LBP abatement project.
    - f. Sketch of LBP control areas and decontamination areas.
    - g. Eating, drinking, smoking, and rest room procedures.
    - h. Sequencing of LBP related work.
    - i. Personnel protective equipment; respiratory protection program and controls.
    - j. Engineering controls, containment structures and safety measures.
    - k. Worker exposure assessment procedures.
    - l. Work practice controls.
    - m. Housekeeping.
    - n. Hygiene facilities and practice.
    - o. Medical surveillance, including medical removal protection.
    - p. Sampling, testing and analytical methods to include personal air sampling requirements of 29 CFR Part 1926.62 and when specified or where required, environmental air sampling, dust wipe sampling (pre-abatement, during abatement, post abatement), toxicity characteristic leaching procedure (TCLP) of the waste material in accordance with 40 CFR Part 261. Procedures must include frequency, locations, and sampling and analytical methods to be used.
  - 2. Waste Disposal Plan
    - a. A written confirmation that the debris will be treated and disposed in accordance with the requirements of 40 CFR Part 260, 40 CFR Part 261, 40 CFR Part 262, 40 CFR Part 264, and 40 CFR Part 268.
    - b. A written confirmation that transportation of the debris will be in accordance with 40 CFR Part 263.
    - c. Waste subcontractor's name, address, telephone number, and landfill location, including copies of licenses and signed agreements.
    - d. Landfill name, address, and telephone number. A copy of the landfill's state and locally issued license, and a signed agreement that the landfill will accept the LBP wastes.
    - e. Detailed delivery tickets or hazardous waste manifests, if applicable, prepared, signed, and dated by an agent of the landfill, certifying the amount of LBP containing materials delivered to the landfill, within 3 days after delivery.

C. Certificates

1. Quality Assurance Certificate – The Contractor shall issue a certification stating that the Contractor will meet the requirements of Paragraph 1.04, QUALITY ASSURANCE. The statements shall be signed and dated by a certifying officer after award of this contract and contain the following:
  - a. Contractor's name and address
  - b. Project name and location.
  - c. The specified requirements that are being certified.

1.4 QUALITY ASSURANCE

A. Qualifications

1. Contractor: Certification that the Contractor has prior experience on LBP abatement projects similar in nature and extent to ensure the capability to perform the abatement in a satisfactory manner.
2. Competent Person: Certification that the Contractor's full-time onsite Competent Person meets the competent person requirements of 29 CFR Part 1926.62 and is experienced in administration and supervision of LBP abatement projects, including work practices, protective measures for building and personnel, disposal procedures, etc. This person shall have completed a Contractor Supervisor LBP abatement course conducted by an EPA Training Center or an equivalent accredited course, and have had a minimum of 2 years on-the-job experience.
3. Certified Industrial Hygienist (CIH): Certification that the CIH has two years prior experience on similar LBP abatement projects and is certified by the American Board of Industrial Hygiene (ABIH). The certification shall include a copy of the ABIH certificate showing certification number and date of certification or recertification.
4. Industrial Hygienist: Certification that the Industrial Hygienist meets the Office of Personnel Management Standard for the Industrial Hygiene Series GS-690, and has a minimum of two years experience in LBP abatement.
5. Testing Laboratory: The name, address, and telephone number of the independent testing laboratory selected to perform sampling and analysis for personal and environmental air samples, lead dust wipes, bulk sample analyses, and TCLP analysis. Documentation that the laboratory performing the analysis is an EPA National Lead Laboratory Accreditation Program (NLLAP) accredited laboratory and that it is rated proficient in the NIOSH/EPA Environmental Lead Proficiency Analytical Testing Program (ELPAT). Certification shall include accreditation for heavy metal analysis, list of experience relevant to analysis of lead in air, and a Quality Assurance and Quality Control Program. Currently, the American Association for Laboratory Accreditation (A2LA) and the American Industrial Hygiene Association (AIHA) are the EPA recognized laboratory accreditors. Documentation shall include the date of accreditation or reaccreditation.
6. Blood Lead Testing Laboratory. The name, address, and telephone number of the blood lead testing laboratory; the laboratory's listing by OSHA and the U.S. Public Health Service Center for Disease Control (CDC); and documentation that the laboratory is certified in the State of Montana.

B. Respiratory Protection Devices

1. Manufacturer's certification of NIOSH or the Mine Safety and Health Administration (MSHA) approval for respiratory protection devices utilized on the site.

C. Cartridges, Filters and Vacuum Systems

1. Manufacturer's certification of NIOSH approval of respirator cartridges (organic vapor, acid gas, mist, dust, high efficiency particulate); High Efficiency Particulate Air (HEPA) filtration capabilities for all cartridges, filters, and HEPA vacuum systems.

- D. Medical Records
  - 1. Certification that employees who are involved in LBP abatement work have received medical examinations and will receive continued medical surveillance, including biological monitoring, as required by 29 CFR Part 1926.62 and by the state and local regulations pertaining to such work. Records shall be retained, at Contractor expense, in accordance with 29 CFR Part 1910.20.
- E. Training
  - 1. Training certification shall be provided prior to the start of work involving LBP abatement, for all of the Contractors' workers, supervisors and Competent Person. Training shall meet the requirements of 29 CFR Part 1926.62, 29 CFR Part 1926.59 and 49 CFR Part 172, and that required by EPA and/or State of Montana LBP regulations. Training shall be provided prior to the time of job assignment and, at least, annually. Training may cover all abatement methods or focus only on those methods specified in the LBP Management Plan. The project specific training shall, as a minimum, include the following.
    - a. Specific nature of the operation which could result in exposure to lead.
    - b. Purpose, proper selection, fitting, use, and limitation of respirators.
    - c. Purpose and description of the medical surveillance program and the medical removal protection program, including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant).
    - d. Relevant engineering controls and good work practices.
    - e. The contents of any compliance plan in effect.
    - f. Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.
    - g. The employee's right of access to records under 29 CFR Part 1910.20.
- F. Licenses and Permits
  - 1. Copies of licenses and permits as required by applicable Federal, state, and local regulation shall be obtained at least 20 days before the start of the LBP abatement project.

## 1.5 DESCRIPTION OF WORK

- A. Lead-Based Paint (LBP) is to be removed according to the Government approved LBP Management Plan. The lead work includes the intact removal and disposal of all LBP coated components (exterior wood entry doors, exterior wood doors, exterior wood door frames, exterior wood door jambs, exterior wood windows, exterior wood soffits and beams (car port areas), exterior metal handrails, interior wood baseboards, interior wood door casings, interior wood windows, interior wood basement windows) in the housing units identified. Additionally, the lead work includes the removal (i.e. stripping) and disposal of LBP on the interior metal portion of crawl space hatches (crawl space hatches are to be left in-place and re-painted as specified elsewhere).
- B. A summary of the LBP identified in representative housing units and their general locations is presented in Maxim Technologies, Inc.'s report entitled "Inspection Report of Asbestos and Lead-Based Painted Building Materials – Capehart Family Housing Improvements, Phase 3" dated October 21, 1999. A copy of the report is included as Appendix A to these specifications.

1.6 SITE VISIT

- A. Contractor shall visit and investigate the site; review the inspection report, drawings and specifications; assess the amount of LBP; and become familiar with conditions which will affect the work.

1.7 LIABILITY INSURANCE FOR LBP

- A. LBP abatement liability insurance shall be obtained without additional expense to the Government. The Contractor shall assume full responsibility and liability for the compliance with Federal, state, and local regulations pertaining to training, work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site.

1.8 PROTECTION OF EXISTING WORK TO REMAIN

- A. Abatement, storage, transportation, and disposal work shall be performed without damage or contamination of adjacent work and areas. Where such work or areas are damaged or contaminated, the Contractor shall restore work and areas to the original condition, unless adjacent areas are to be subsequently demolished, then decontaminate only.

1.9 COORDINATION WITH OTHER WORK

- A. Abatement and disposal work shall be coordinated with existing work and/or concurrent work being performed in adjacent areas.

1.10 SAFETY AND HEALTH REGULATORY REQUIREMENTS

- A. Work shall be performed in accordance with requirements of EM 385-1-1 and applicable regulations including, but not limited to, 29 CFR Part 1910, 29 CFR Part 1926, especially 1926.62. Matters of interpretation of the standards shall be submitted to the appropriate agency for resolution before starting work. Where these requirements vary, the most stringent shall apply.

1.11 PRE-CONSTRUCTION SAFETY MEETING

- A. The Contractor and Competent Person shall attend a pre-construction safety meeting prior to starting any work involving LBP abatement. Items required to be submitted will be reviewed for completeness, and where specified, for acceptance.

1.12 ACCIDENT PREVENTION PLAN

- A. Preparation and Implementation
  - 1. The Accident Preparation Plan (APP) shall be prepared in accordance with EM 385-1-1, Table 1-1. Where a topic in Table 1-1 is not applicable, the APP shall justify its omission or reduced level of detail, and shall establish that adequate consideration was given to the topic. The APP shall cover onsite work by the Contractor or subcontractors. The Competent Person shall be responsible for development, implementation, and quality control of the content and actions required in the APP. For each anticipated work task,

the APP shall establish hazards and control measures. The APP shall be easily readable and understandable by the Contractor's work force.

B. Acceptance and Modifications

1. The APP shall be prepared, signed and dated by the Contractor's Competent Person and submitted ten working days prior to the Pre-Construction Safety Meeting. Deficiencies in the APP shall be discussed at the Pre-Construction Safety Meeting and the APP shall be revised to correct the deficiencies, and resubmitted for acceptance. Onsite work shall not begin until the APP has been accepted unless otherwise authorized by the Contracting Officer. One copy of the APP shall be maintained in the Contractor's jobsite file, and a second copy shall be posted where it will be accessible to personnel on the site. As work proceeds, the APP shall be adapted to new situations and conditions. Changes to the APP shall be made with concurrence of the Competent Person and Site Superintendent, and acceptance of the Contracting Officer. Should an unforeseen hazard become evident during performance of the work, the Competent Person shall bring such hazard to the attention of the Superintendent and the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, the Contractor shall take necessary action to re-establish and maintain safe working conditions; and to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of this specification, or for the accepted APP shall be cause for stopping work until the matter is rectified.

1.13 RESPIRATORY PROTECTION PROGRAM

- A. A respiratory protection program shall be established, as required by 29 CFR Parts 1926.62 and 1926.103 and in accordance with 29 CFR Part 1910.134. An approved respirator shall be furnished to each employee and visitor required to enter a LBP work control area. A fit test shall be conducted in accordance with 29 CFR Part 1926.62, Appendix D.

1.14 HAZARD COMMUNICATION PROGRAM

- A. A Hazard Communication Program shall be implemented in accordance with 29 CFR Part 1926.59.

1.15 SAFETY AND HEALTH OVERSIGHT

- A. The Competent Person shall be the onsite person responsible for coordination, safety, security and execution of the work. The Competent Person shall be able to identify existing and predictable lead hazards and shall have the authority to take corrective measures to eliminate them. The CIH shall be responsible for dust wipe, and personal and environmental sampling.

1.16 PREPARATORY INSPECTION MEETING

- A. The Contractor, Competent Person and CIH shall arrange and hold a preparatory inspection meeting immediately prior to beginning any LBP abatement. The APP, Activity Hazard Analyses, and the Contractor's LBP Management Plan, including containment, engineering controls, worker protection, training and monitoring, will be reviewed for completeness.

1.17 TRAINED AND COMPETENT PERSONNEL

- A. Work shall be supervised by Competent Persons and performed by workers. Supervisors and workers shall be qualified and trained in the abatement, enclosure, encapsulation, monitoring, testing, storage, treatment, hauling, and disposal of contaminated LBP material and debris, and in subsequent cleanup of the affected environment. Supervisors and workers shall comply with the appropriate Federal, state, and local regulations which mandate training requirements and work practices and shall be capable of performing the work under this contract.

1.18 POSTED WARNING AND NOTICES

- A. The following regulations, warnings, and notices shall be posted at the work site in accordance with 29 CFR Part 1926.62.

1. Regulations

- a. Two copies of applicable Federal, state, and local regulations and NIOSH OSHA Booklet 3142 shall be maintained. One copy shall be posted at the work site and one copy shall be on file in the project office.

2. Warning Signs

- a. Warning signs shall be provided at building entrances and approaches to LBP control areas containing LBP debris. Signs shall be located at a distance from the LBP control areas that will allow personnel to read the sign and take the necessary protective actions required before entering the LBP control area.
- b. Warning signs shall be in English and be of sufficient size to be clearly legible and display the following:

WARNING  
LEAD WORK AREA  
POISON  
NO SMOKING OR EATING  
AUTHORIZED PERSONNEL ONLY  
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

3. Warning Labels

- a. Provide labels and affix to all LBP materials, scrap, waste, debris, and other products contaminated with LBP.
- b. Warning labels shall be in English and be of sufficient size to be clearly legible and display the following:

DANGER  
CONTAINS LEAD  
POISON

4. Worker Information

- a. Right-to-know notices shall be placed in clearly visible areas of the work site in compliance with Federal, state, and local regulations.

5. Air Monitoring Results

- a. Daily air monitoring results shall be prepared so as to be easily understood by the workers, and shall be placed in a clearly visible area of the work site.

6. Emergency Telephone Numbers

- a. A list of telephone numbers shall be posted at the site. The list shall include numbers of the local hospital, emergency squad, police and fire departments, Government and Contractor representatives who can be reached 24 hours per day, and professional consultants directly involved in the project.

1.19 STORAGE OF MATERIALS

- A. Materials shall be stored in a place and manner which protects them from damage and contamination. During periods of cold weather, plastic materials shall be protected from the cold. No flammable or hazardous materials shall be stored inside any building. Regularly inspect materials to identify damaged or deteriorating items. Damaged or deteriorated items shall not be used and shall be removed from the site as soon as they are discovered. Any materials which become contaminated with LBP waste shall be disposed of consistent with the requirements of 40 CFR Part 148 and these specifications. Stored materials shall not present a hazard or an inconvenience to workers, visitors, and/or other occupants and employees of the building.

PART 2 - PRODUCTS

2.1 EQUIPMENT AND MATERIALS

- A. Sufficient quantities of health and safety materials required by 29 CFR Part 1926.62, and other materials and equipment needed to complete the project, shall be available and kept on the site.
- B. Respirators
  - 1. Air-purifying respirators shall be approved by NIOSH for use with dust, fumes, and mists having permissible exposure limits less than 0.05 milligrams per cubic meter (i.e., have high-efficiency particulate air (HEPA) filters) and for other hazardous airborne contaminants that may be encountered, as determined by the Competent Person. Respirators shall comply with the requirements of 29 CFR Part 1926.62 and shall be used in accordance with 29 CFR Part 1926.103 and 29 CFR Part 1910.134.
- C. Respirator Cartridges
  - 1. A sufficient supply of respirator cartridges shall be maintained at the work site to provide new cartridges to employees, authorized visitors, and Government personnel throughout the duration of the project. Cartridges shall be replaced according to the manufacturer's recommendations, when breathing becomes difficult, or if the cartridge becomes wet.
- D. Protective Clothing
  - 1. The Contractor shall furnish, at no cost to personnel, equipment/clothing for protection from airborne and waterborne LBP debris. An adequate supply of these items shall be available for worker, authorized visitor, and Government personnel use. Workers and visitors shall not take protective clothing and equipment off the work site at any time. Protective clothing includes:
    - a. Coveralls (Whole Body Protective Coverings): Full-body coveralls and head covers shall be worn by workers in the work area. Sleeves shall be secured at the wrist and pants legs at the ankle with tape. Permeable clothing shall be provided in heat-stress conditions. Where non-disposable coveralls are provided, these coveralls shall be cleaned after each wearing. Cleaning of coveralls and other non-disposable clothing shall be in accordance with the provisions for cleaning in 29 CFR Part 1926.62.
    - b. Boots: Work boots with nonskid soles or impermeable work boot covers shall be worn by workers. Where required by OSHA, safety boots (steel toe or steel toe and shank) shall be worn. Paint the uppers of boots red with waterproof enamel. Do not allow boots to be removed from the work area for any reason after being contaminated with LBP debris. Dispose of boots as LBP contaminated waste at the end of the work.

- c. Gloves: Inner gloves, appropriate for items and hazards encountered, and disposable outer work gloves shall be provided to each worker and shall be worn while the worker is in the work area. Glove material shall be appropriate for the specific chemical exposure. Gloves shall not be removed from the work area, and shall be disposed as LBP contaminated waste at the end of the work.
  - d. Hard Hats: Head protection (hard hats) shall be provided as required by OSHA and EM 385-1-1 for workers and authorized visitors. Protective plastic strap suspension hats shall be used. Hard hats shall be worn at all times that work is in progress. Hats shall remain in the work area until the project is completed. Hats shall be thoroughly cleaned, decontaminated, and bagged before being removed from the work area at the end of the project.
  - e. Eye Protection: Fog-proof goggles for personnel engaged in LBP abatement operations shall be worn when the use of a full face piece respirator is not required.
- E. Negative Air Pressure System
  1. When a LBP control area requires the use of an airtight containment barrier, a negative air pressure system shall be used, and pressure differential recordings taken. LBP shall not be removed from the LBP control area until the proper engineering controls and HEPA filtration systems are in place.
- F. HEPA Filter Requirements
  1. The negative air pressure system shall be equipped with approved HEPA filters per UL 586. Negative air pressure equipment shall be equipped with new HEPA filters, and shall be sufficient to maintain a minimum pressure differential of minus 0.02 inch of water column relative to adjacent, unsealed areas. Negative air pressure system minimum requirements are listed below.
  2. The unit shall be capable of delivering its rated volume of air with a clean first stage filter, an intermediate filter and a primary HEPA filter in place.
  3. The HEPA filter shall be certified as being capable of removing particles as small as 0.3 micrometers at a minimum efficiency of 99.97 percent.
  4. The unit shall be capable of continuing to deliver no less than 70 percent of rated capacity when the HEPA filter is 70 percent full or measures 2.5 inches of water static pressure differential on a magnehelic gage.
  5. The unit shall be equipped with a manometer-type negative pressure differential monitor with minor scale division of 0.02 inch of water and accuracy within plus or minus 1.0 percent. The manometer shall be calibrated daily as recommended by the manufacturer. Record manually manometer readings of the pressure differential between the LBP control area and adjacent unsealed areas at the beginning of each workday and every 2 working hours thereafter.
  6. The unit shall be equipped with a means for the operator to easily interpret the readings in terms of the volumetric flow rate of air per minute moving through the machine at any given moment.
  7. The unit shall be equipped with an electronic mechanism that automatically shuts the machine off in the event of a filter breach or absence of a filter.
  8. The unit shall be equipped with an audible horn that sounds an alarm when the machine has shut itself off.
  9. The unit shall be equipped with automatic safety mechanism that prevents a worker from improperly inserting the main HEPA filter.
  10. The unit shall be ducted through the containment barrier wall to the outside of the building. The unit shall not be exhausted into any work area.
- G. Number of Units Required
  1. The air within the containment barrier shall be changed at least once every 15 minutes by a continuously operating negative air pressure system, until the LBP control area barrier

- is removed. Filters shall be replaced as necessary to maintain the efficiency of the system. A backup unit shall be maintained onsite.
2. Discontinuing Negative Air Pressure System
    - a. The negative air pressure system shall not be shut down during LBP abatement work unless authorized by the Contracting Officer. At the completion of the LBP abatement and disposal project, units shall be run until full cleanup has been completed and wipe clearance samples have been collected, analyzed, and have passed final clearance testing requirements. Dismantling of the negative air pressure systems shall conform to the written decontamination procedures. Prefilters shall be removed and properly disposed of, and the intake to the machines shall be sealed with polyethylene to prevent environmental contamination.
- H. Expendable Supplies
1. Polyethylene Sheet and Bags – General
    - a. Polyethylene sheet and bags shall be minimum 6 mils thick. Bags shall have pre-printed labels per OSHA and EPA guidelines. Polyethylene sheets shall be in roll sizes to minimize seams.
  2. Polyethylene Sheet - Flame Resistant
    - a. Where a potential for fire exists, flame-resistant polyethylene sheets shall be provided. Polyethylene film shall be frosted and shall conform to the requirements of NFPA 701.
  3. Polyethylene Sheet – Reinforced
    - a. Reinforced polyethylene sheet shall be provided where high skin strength is required such as where it constitutes the only barrier between the LBP control area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between two layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.
  4. Tape and Adhesive Spray
    - a. Tape and adhesive shall be capable of sealing joints between polyethylene sheets and for attachment of polyethylene sheets to adjacent surfaces. After dry application, tape or adhesive shall retain adhesion when exposed to wet conditions, including amended water. Tape shall be minimum 2 inches wide, industrial strength.
  5. Containers
    - a. Impermeable containers shall be used to receive and retain lead contaminated material until disposal. Containers shall be labeled in accordance with EPA, DOT and OSHA standards.
  6. Tri-Sodium Phosphate (TSP) Cleaning Solution
    - a. Tri-sodium phosphate cleaning solution, such as Sentinel 805 (Sentinel Chemical Company) or equivalent and water, mixed to manufacturer's specifications.
- I. Vacuum Systems
1. HEPA filtered vacuum systems shall be used during abatement operations which generate dust. The systems shall be suitably sized for the project, and filters shall be capable of removing particles as small as 0.3 micrometers at a minimum efficiency of 99.97 percent.
- J. Heat Blower Guns
1. Heat blower guns shall be flameless, electrical, paint-softener type with controls to limit temperature to 1,100 degrees F.
- K. Chemical Paint Strippers/Neutralizers
1. Chemicals paint strippers and paint stripper neutralizers shall be properly labeled and stored in leak-tight containers.

2. Chemicals paint strippers/neutralizers shall be commercially available products intended for paint removal such as the "Peel Away Series" manufactured by Dumond Chemicals, or equivalent. Products shall be applied in accordance with manufacturer's instructions and recommendations.
  3. Chemical paint strippers shall contain no methylene chloride and shall be formulated to prevent stain, discoloration, or raising of the substrate materials.
  4. Neutralizers for paint strippers shall be used on exteriors only and shall be compatible with the substrate and suitable for use with the chemical stripper that has been applied to the surface.
- L. Other Materials
1. The Contractor shall provide standard commercial quality of all other materials such as lumber, nails, and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area, and to complete the work.

### PART 3 - EXECUTION

#### 3.1 WORK PROCEDURE

- A. LBP abatement and related work shall be performed in accordance with the accepted Contractor's LBP Management Plan as modified and approved. Procedures and equipment required to limit occupational and environmental exposures to lead during LBP removal shall be in accordance with 29 CFR Part 1926.62, and as specified herein. Paint chips and associated waste shall be disposed of in compliance with Federal, state, and local regulations.
- B. Personnel Protection Procedures
1. Personnel shall wear and use protective clothing and equipment as specified. Eating, smoking, drinking, chewing tobacco and chewing gum, and applying makeup shall not be permitted in the LBP control area. Personnel of trades not engaged in the abatement and disposal of LBP shall not be exposed at any time to airborne concentrations of lead equal to or in excess of 30 micrograms per cubic meter of air. Electrical service shall be disconnected when wet removal is performed, and temporary electrical service protected by a ground fault circuit interrupter shall be provided.
- C. Safety and Health Procedures
1. The Competent Person shall be present on the work site throughout the abatement project to supervise, monitor, and document the Contractor's health and safety provisions on the project. A daily log shall be maintained showing the results of sampling tests throughout the project area. LBP abatement work being conducted within a LBP Control area where an airtight barrier is required shall be stopped if dust wipe concentration levels collected outside the containment area during abatement, equal or exceed the pre-abatement level or 200 micrograms per square foot, whichever is greater.
- D. Safety and Health Responsibilities
1. The Competent Person shall:
    - a. Verify that training meets applicable requirements.
    - b. Review and approve LBP Management Plan for conformance to the applicable referenced standards.
    - c. Inspect LBP removal work for conformance with the accepted LBP Management Plan.
    - d. Ensure that worker exposure air monitoring activities are in accordance with 29 CFR Part 1926.62.

- e. Ensure work is performed in strict accordance with specifications.
    - f. Ensure hazardous exposure to personnel and to the environment are adequately controlled.
  - 2. The CIH shall:
    - a. Be responsible for directing personal and environmental air monitoring, and lead dust wipe sampling.
- E. Medical Surveillance Procedures
  - 1. Medical surveillance shall be implemented in accordance with the approved Contractor's LBP Management Plan, and shall comply with the requirements of 29 CFR Part 126.62, including the provisions for biological monitoring, medical removal protection and a physician's written opinion, signed by the physician performing the employee examination. The Contractor shall provide a copy of the written opinion for Contractor's employees two days prior to each employee's commencement of work.
- F. Engineering Controls and Containment Structures
  - 1. LBP Control Area
    - a. The LBP control area is where LBP abatement work occurs and as such shall be considered contaminated, and shall be isolated to prevent LBP containing dust or debris from passing into adjacent building or open areas. The control area shall be decontaminated at the completion of the LBP abatement and disposal work.
  - 2. Boundary Requirements
    - a. Physical boundaries shall be provided around exterior LBP control areas by roping off the area indicated in the LBP Management Plan. Interior projects shall be isolated by curtains, portable partitions, or other enclosures to ensure that concentrations of lead dust outside the LBP control area will not exceed the pre-abatement level or 200 micrograms per square foot, whichever is greater.
  - 3. Control Barriers
    - a. The LBP control area shall be separated from other portions of the building and the outside with control barriers. The polyethylene sheeting will have all openings masked and sealed, and shall be erected according to the Contractor's LBP Management Plan. Polyethylene sheeting will have all openings masked and sealed, and shall be erected according to the Contractor's LBP Management Plan. Polyethylene sheeting shall be mechanically supported, independent of duct tape or spray adhesive.
  - 4. Pre-Abatement Lead-Dust Wipe Samples
    - a. Pre-abatement lead-dust wipe samples shall be taken outside the LBP controlled area. Samples shall be taken within 10 feet of the abatement structure at 20 percent of the areas planned for abatement.
  - 5. Masking and Sealing
    - a. Interior LBP control area requirements: Openings shall be sealed where the release of airborne LBP dust is expected. A control area shall be established with the use of curtains, portable partitions, or other systems in order to prevent the escape of dust from the contaminated control area. The control area shall be provided with protective covering of two layers of 6-mil polyethylene sheeting over floor, walls, floors and ceiling. Penetrations of the floor, walls and ceiling shall be sealed with 6-mil polyethylene sheeting and duct tape. Polyethylene sheeting shall be firmly attached to the structure. Joints shall be sealed with spray adhesive and duct tape. Openings shall be provided for the supply and exhaust of air for the negative air pressure system. Personal monitoring during the work shift shall be in accordance with 29 CFR Part 1926.62.
    - b. Exterior LBP control area requirements: Where the construction of a contained LBP control area is impractical, perimeter barriers shall be installed 20 feet from, and around, the area where the LBP handling procedures are performed, 6 mil polyethylene shall be installed beneath the LBP control work area as "drop cloths",

and other requirements for LBP control areas shall be maintained. Personal monitoring of airborne concentrations shall be conducted in adjacent areas, during the work shift, in accordance with 29 CFR Part 1926.62. Where wipe sampling is not practical, air monitoring outside of the perimeter barriers shall be conducted as specified. Airborne concentrations shall not exceed specified levels.

6. Personnel Decontamination Unit Procedures

- a. Decontamination units shall be constructed when required for the abatement procedures. Materials fabricated or delivered to the site before the shop drawings have been returned to the Contractor will be subject to rejection by the Contracting Officer. Specifications and drawings of portable prefab units, such as a trailer unit, if utilized, must be submitted for review and approval before start of construction. Submittal shall include, but not be limited to, a floor plan layout showing dimensions, materials, sizes, thicknesses, plumbing, and electrical outlets. Access between contaminated and uncontaminated rooms or areas shall be through an airlock. Access between two rooms or room and trailer within the decontamination unit shall be through a plastic sheeting curtained doorway. A separate equipment decontamination unit shall be provided. Each work area shall have an emergency exit. The personnel decontamination unit's clean room shall be the only means of entrance and exit, except for emergencies, from the LBP control area. Materials shall exit the LBP control area through the equipment decontamination area.

7. Clean Room Procedures

- a. The clean room shall have only one exit to non-contaminated areas of the building or site. An airtight seal shall be constructed of polyethylene between the clean room and the rest of the building. Surfaces of the clean room shall be protected with sheet polyethylene. A temporary unit with a separate equipment decontamination locker room and a clean locker room shall be provided for personnel who are required to wear whole body protective clothing. One locker shall be provided in each locker room for each LBP abatement worker, and each Contractor's representative. Lead-free personal clothing and shoes shall be kept in the clean locker. Hand wash station/showers shall be located between the equipment decontamination locker room and the clean locker room, and employee shall wash or shower before changing into personal clothes. An adequate supply of clean disposable towels shall be provided. Clean rooms shall be physically attached to the LBP control area for areas inside the building but may be directly adjacent to the LBP control area outside of the building. Joint use of this space for other functions, such as offices, equipment storage, etc., is prohibited.

8. Hand Wash Station/Shower Room Procedures

- a. An operational shower and hand washing station shall be provided between the work area and the clean changing room. Workers shall wash and shower before entering the clean changing room. Shower room shall be separated from other rooms by air tight walls fabricated from polyethylene sheeting. Water shall be hot and cold or warm. Shower heads and controls, soap dish, continuing supply of soap, and clean towels shall be provided. The shower shall be maintained in a sanitary condition. Waste water shall be pumped to drain and through waste water filters that meet state and local requirements. These filters shall be located inside the shower unit and filters shall be changed regularly. Spent filters shall be discarded as LBP contaminated waste.

9. Equipment Decontamination Unit Procedures

- a. The Equipment Decontamination Unit shall be used for removal of equipment and materials from the LBP control area, and shall include a wash room, holding room, and an enclosed walkway. The unit shall be constructed from wood framing material and polyethylene sheeting. Workers shall not enter or exit the LBP control area through the Equipment Decontamination Unit. A wash-down station, consisting of an enclosed shower unit, shall be located in the work area outside the

Wash Room. The washdown station shall be used to clean equipment, bags and containers. Bagged or containerized LBP wastes shall be passed from the work area and cleaned in the Wash Room. The Wash Room shall be separated from the work area by a polyethylene sheeting flap. Wastewater shall be filtered and filters shall be changed as required for the contaminated wastes. The Holding Room shall be used as a drop location for bagged LBP passed from the Wash Room. This room shall be constructed so that bagged materials cannot be passed from the Wash Room through the Holding Room to the enclosed walkway. The walkway shall be separated from adjacent rooms by double flaps of 1/16-inch thick single ply rubber roofing materials of EPDM or Neoprene. The enclosed walkway shall isolate the Holding Room from the building exterior and shall be constructed of wood framing and polyethylene sheeting. The walkway shall provide access to the Holding Room from the building exterior. The enclosed walkway shall be separated from the exterior by a single flap of polyethylene sheeting.

10. Maintenance of Decontamination Units
  - a. Barriers and polyethylene sheeting shall be effectively sealed and taped. Containment barriers shall be visually inspected at the beginning of each work period. Damaged barriers and defects shall be immediately repaired upon discovery. Smoke methods shall be used to test effectiveness of barriers when directed by the Contracting Officer.
11. LBP Control Area Exiting Procedures
  - a. Personnel exiting a LBP control area shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:
    - 1) Vacuum all protective clothing before removing.
    - 2) Remove protective clothing in the decontamination room, and place this clothing in an approved impermeable disposal bag.
    - 3) Wash or shower.
    - 4) Change to clean clothes prior to leaving the physical boundary designated around the lead-contaminated work site.

G. Furnishings

1. The Contractor shall remove furniture and equipment from the work area before LBP removal work begins.

H. Building Ventilating Systems

1. Any building ventilating system or any other system bringing air into or out of the LBP control work area shall be isolated by airtight seals, or other positive means that will prevent spread of contamination through the system. Airtight seals shall consist of rigid covers for supply and exhaust grills and one layer of polyethylene. Individual seals shall be applied to ventilation openings (supply and exhaust), lighting fixtures, clocks, windows, doorways, elevator doors, stairs, ramps, speakers, and other openings into the work area. Seals shall be maintained until project decontamination is completed. After decontamination work has been completed and final air sample testing proves that the area is decontaminated, seals shall be removed and the ventilating systems may be operated again.

I. Temporary Utilities

1. Temporary equipment to provide adequate power, light, heat, and water shall be installed to accomplish the abatement operations properly and safely. The Contractor shall maintain the security and maintenance of the utility system in the LBP control areas. In the event of a failure of any utility system, the Government will not be responsible for any loss of time or other expense incurred by the Contractor. In addition, the Contractor shall provide:

- a. Backflow protection on all water connections. Fitting installed by the Contractor shall be removed after completion of work with no damage or alteration to existing water piping and equipment.
- b. Heavy-duty abrasion-resistant hoses to provide water to each work area and decontamination area.
- c. A hot water heater, if hot water is not supplied through the building's existing water supply to the decontamination showers.
- d. Electrical service to work areas. Electrical service shall comply with NEMA, NECA, and UL standards. Warning signs shall be posted at power outlets which are other than 110-120 volt power. Ground fault protection or assured grounding programs, as required by OSHA, shall be in effect all times. Only grounded extension cords shall be used. Temporary lamps and light fixtures shall be of adequate wattage to provide good illumination in LBP control areas.
- e. Temporary heating units, when needed, that have been tested and labeled by UL, FM, and another recognized trade association related to the fuel being consumed. Forced air or fan type units shall not be utilized inside a work area. Units shall have tip-over protection.
- f. Sufficient quantity of single-occupant, self-contained chemical toilets, properly vented and fully enclosed, if permanent toilets are not available.

### 3.2 LBP ABATEMENT METHODS

- A. Component Replacement
  - 1. All LBP coated components identified for replacement shall be removed in their entirety, with the LBP coating intact, from the housing units. All debris shall be handled in accordance with the Hazardous Waste Management Plan.
- B. Heat Gun Softening
  - 1. LBP shall be softened with a heat gun prior to removal of components in order to prevent chips of LBP from dislodging during use of wrecking bars or other tools to remove the components. Paint residue, if generated, shall be handled in accordance with the Hazardous Waste Management Plan. Heat guns shall be operated below 1,100 degrees F to prevent possible release of toxic fumes or starting a fire.
- C. Chemical Stripping
  - 1. LBP shall be removed using chemical strippers in accordance with manufacturer's instructions.

### 3.3 MONITORING

- A. During the entire LBP removal and disposal operations, a Competent Person or CIH shall be onsite directing the monitoring/sampling and inspecting the work to ensure that the health and safety requirements of this contract are satisfied. The monitoring and sampling activities may be performed by the CIH or the Testing Laboratory under the direction of the CIH.
- B. Personal Air Monitoring
  - 1. Airborne concentrations of lead shall be collected by the CIH or Testing Laboratory and analyzed in accordance with 29 CFR Part 1926.62. Results shall be reported in micrograms per cubic meter of air. The Competent Person and CIH shall use personal air monitoring results to determine if proper work practices are being employed. The Contracting Officer shall be notified if any personal air monitoring result equals or exceeds 30 micrograms per cubic meter of air. The Contractor shall take steps to reduce the concentration of lead in the air.

- C. Wipe Sampling
  - 1. Wipe sampling for lead dust concentrations shall be conducted:
    - a. Pre-abatement to establish a baseline.
    - b. During abatement to monitor activities and ensure containment integrity.
    - c. Post-abatement to determine if specified clearance criteria have been met.
  - 2. Pre-Abatement
    - a. The CIH or Testing Laboratory shall collect pre-abatement wipe samples outside the LBP control area as specified.
  - 3. Abatement
    - a. The CIH or Testing Laboratory shall collect abatement wipe samples during all LBP abatement activities on a daily basis. The samples shall be collected outside the LBP control work area at critical barriers, in the clean room of the decontamination unit and in traffic control areas such as personal and equipment entrances.
  - 4. Results
    - a. The Contractor shall have the results of the wipe sampling within 48 hours after the completion of the sampling. Results shall be reported in micrograms per square foot.
  - 5. Excessive Levels
    - a. LBP abatement work being conducted within a LBP control area shall be stopped if measured dust wipe concentration levels collected outside the containment area, during abatement, equal or exceed the pre-abatement levels or 200 micrograms per square foot, whichever is greater. The Contractor shall immediately notify the Contracting Officer. At the direction of the Contracting Officer, the Contractor shall clean outside areas which equal or exceed the levels stated above, at no additional cost to the Government. The cleaning shall be in accordance with Paragraph 3.05, CLEANUP AND DISPOSAL, prior to clearance. The Contractor shall collect and have analyzed additional wipe samples at no charge to the Government to ensure the areas are clean. Cleaning and resampling shall continue until levels as stated above are achieved. The Contractor shall correct containment and work practices to mitigate the problem. Removal work shall resume when approval is given by the Contracting Officer.
  - 6. Post Abatement
    - a. The CIH or Testing Laboratory shall collect post abatement samples in accordance with Paragraph 3.05.C., Final Clearance Testing.
- D. Area Air Monitoring
  - 1. Airborne concentrations of lead shall be collected and analyzed in accordance with 29 CFR Part 1926.62. Results shall be reported in micrograms per cubic meter of air.
  - 2. Pre-abatement
    - a. The CIH or Testing Laboratory shall collect pre-abatement air samples outside the LBP control work area.
  - 3. Abatement
    - a. The CIH or Testing Laboratory shall collect area air samples on a daily basis. The samples shall be collected outside the LBP control work area at critical barriers, in the clean room of the decontamination unit and in traffic control areas such as personal and equipment entrances.
  - 4. Results
    - a. The Contractor shall have the results of the area air monitoring within 48 hours after completion of the sampling. Results shall be reported in micrograms per cubic meter of air.
  - 5. Excessive Levels
    - a. LBP abatement activities shall cease and the Contracting Officer shall be notified if measured airborne lead concentrations, collected during abatement, exceed the pre-abatement airborne concentration levels. The Contractor may be required to

clean and resample the affected area, at no additional cost to the Government, if directed by the Contracting Officer. The Contractor shall correct the work practices and engineering controls and shall resume abatement at the direction of the Contracting Officer.

- E. Waste Sampling and Testing
  - 1. Sampling and testing of all waste shall be in accordance with 40 CFR Part 261.

### 3.4 ADJACENT AREAS

- A. Damage to adjacent areas shall be repaired to the approval of the Contracting Officer.

### 3.5 CLEANUP AND DISPOSAL

- A. Cleanup
  - 1. Daily
    - a. Surfaces in the LBP control area shall be maintained free of accumulations of paint chips and dust. Spread of dust and debris shall be restricted; waste shall not be distributed over the work area. Dry sweeping or compressed air shall not be used for cleanup. At the end of the shift, the area shall be cleaned of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner and wet mopping the area. LBP abatement work shall cease during the cleanup.
  - 2. Prior to Clearance
    - a. Upon completion of the lead paint abatement and a satisfactory visual inspection by the Contracting Officer in a given work area, a preliminary clean-up shall be performed by the Contractor. This clean-up includes removal of any contaminated material, equipment or debris including polyethylene sheeting from the work area, except for critical barriers. The polyethylene sheeting shall be sprayed or misted with water for dust control, abatement debris removed and then the sheeting removed by folding it in upon itself. Polyethylene sheeting used for critical barriers shall remain in place until final clearance is achieved. The following methodology shall be utilized during the cleanup prior to clearance.
      - 1) Lead-contaminated debris shall be containerized in accordance with Paragraph 3.05.F.2., Contaminated Waste. Waste bags shall not be overloaded, shall be securely sealed and stored in the designated area until disposal.
      - 2) Non-contaminated debris shall be containerized; removed from the work area and stored in the designated area until disposal in accordance with Paragraph 3.05.F.3., Non-Contaminated Waste.
      - 3) Removal of surface polyethylene sheeting shall begin from upper levels such as cabinets and shelves. Removal of floor polyethylene sheeting shall begin at the corners and shall be folded in toward the middle to contain the dust. Polyethylene shall be disposed of as specified for debris.
      - 4) Cleaning. Once the polyethylene sheeting, except critical barriers, is removed from the work area, cleaning shall begin. It shall be done in the following sequence: HEPA-vacuum; Tri-Sodium Phosphate (TSP) wash (or equivalent cleaner); and HEPA-vacuum.
      - 5) HEPA-Vacuum. Vacuum all surfaces. Begin with ceilings and proceed down the walls, including window, doors, door trim and ending with floors. Begin vacuuming at the furthest corner from the entrance to the work area and move toward the entrance.

- 6) Wet Wash. Wash or mop the surfaces vacuumed in the same sequence. Contractor shall utilize a Tri-Sodium Phosphate (TSP) detergent solution or other equally effective cleaning agent and allow surface to dry.
- 7) Cleaning Equipment. The Contractor shall prepare and use detergents containing five to ten percent TSP or other equally effective cleaning agent which shall be used in accordance with the manufacturers instructions. The waste water from cleaning shall be contained and disposed of according to applicable Federal, state and local regulations and guidelines. The waste water shall not be disposed of in storm sewers or sanitary sewers without specific and written Government approval.

B. Visual Inspection

1. Upon completion of the final cleaning, the Contractor shall notify the Contracting Officer and request a final visual inspection with the Contracting Officer's representative with the criteria in the final cleaning/visual inspection example format sheet located at the end of this section. If the area does not pass the visual inspection, the Contractor shall reclean the area as required by Paragraph 3.05, CLEANUP AND DISPOSAL, at no additional expense to the Government. Final clearance testing shall not proceed until the Contracting Officer has accepted the final cleaning by the Contractor.

C. Final Clearance Testing

1. Final clearance surface dust sampling shall be conducted after a thorough cleanup has been completed in accordance with the following:
  - a. Onsite paint removal in limited areas. Three samples shall be taken (one from a window sill, one from a window well, and one from the floor) in each area abated and one sample outside the containment area (within 10 feet in 20 percent of the abated units). Pre-abatement wipe samples shall be compared to determine if dust from the abatement process has contaminated non-abated areas. The Contractor shall clean up these areas if contamination from the abatement process occurs.
  - b. Component replacement throughout the unit. One wipe sample shall be taken in each abated area divided equally between window wells, window sills, and floors, and one wipe sample outside the containment area within 10 feet in 20 percent of the abated units.
  - c. Exterior abatement. At least one wipe sample shall be taken on a horizontal surface in part of the living area, such as a front porch.
2. Clearance Criteria
  - a. Floors – 100 micrograms per square foot or less
  - b. Interior Window Sills – 500 micrograms per square foot or less
  - c. Window Wells - 800 micrograms per square foot or less
  - d. Exterior Concrete or Other Rough Surfaces – 800 micrograms per square foot or less
3. Retests
  - a. Should laboratory results indicate that the wipe test clearance level is exceeded, the Contractor shall reclean the affected area, at no additional cost to the Government. The Contractor shall utilize specified cleaning methods. Retesting will then be performed to determine if specified clearance criteria was met. The Contractor shall pay for additional testing and shall provide, at no additional cost, a recleaning of an affected area until the clearance level is achieved.

D. Certification

1. The CIH shall certify in writing that inside the LBP control area and the area external to the LBP control area met final clearance requirements.

- E. Removal of Control Area
  - 1. After approval of the final clearance certification, and when authorized by the Contracting Officer, the LBP control area, containment barriers, and control structures roped-off boundary and warning signs shall be removed.
- F. Disposal
  - 1. Toxicity Characteristic Leaching Procedure (TCLP).
    - a. Results of the TCLP analysis of the LBP waste shall be used to determine disposal procedures.
  - 2. Contaminated Waste
    - a. Lead-contaminated waste, scrap, and debris shall be disposed of as follows:
      - 1) Lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing, which may produce airborne concentrations of lead particles shall be stored in U.S. Department of Transportation 49 CFR Part 178 approved 200 liter (55 gallon) drums. Each drum shall be labeled to identify the type of waste as defined in 49 CFR Part 172 and the date lead-contaminated wastes were first put into the drum. The Uniform Hazardous Waste Manifest forms from Federal and state agencies shall be obtained and completed. Land disposal restriction notifications shall be as required by 40 CFR Part 268. The Contracting Officer shall be notified at least 14 calendar days prior to delivery to arrange for job site inspection of the drums and manifests. Lot deliveries of hazardous wastes shall be made as needed to ensure that drums do not remain on the work site longer than 90 calendar days from the date affixed to each drum. The Contracting Officer will assign an area of interim storage of waste-containing drums.
      - 2) Lead-contaminated waste shall be handled, stored, transported, and disposed of in accordance with 40 CFR Part 20, 40 CFR Part 261, 40 CFR Part 262, 40 CFR Part 263, 40 CFR Part 264, and 40 CFR Part 265. Land disposal restriction notification shall be as required by 40 CFR Part 268.
  - 3. Non-Contaminated Waste
    - a. Non-contaminated waste, scrap, and debris shall be disposed of at an authorized off-site disposal area in accordance with applicable Federal, state and local regulations.
- G. Disposal Documentation
  - 1. Written evidence shall be provided that the hazardous waste treatment, storage, or disposal facility is approved for lead disposal by the EPA and state or local regulatory agencies. One copy shall be submitted of the completed manifest; signed, and dated by the initial transporter in accordance with 40 CFR Part 262.
- H. Title to Materials
  - 1. All LBP and LBP-contaminated materials resulting from removal work, except as specified otherwise, shall become the property of the Contractor, as well as the Government, and shall be disposed of as specified.
- I. Payment for Hazardous Waste
  - 1. Payment for disposal of hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials delivered is returned and a copy is furnished to the Government.

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**CERTIFICATION OF FINAL CLEANING AND VISUAL INSPECTION**

Individual abatement task as identified in paragraph DESCRIPTION OF WORK

\_\_\_\_\_  
In accordance with the clearing and decontamination procedures specified in the Contractor's lead hazard abatement plan and this contract, the Contractor hereby certifies that he/she has thoroughly visually inspected the decontaminated regulated work area (all surfaces, including pipes, beams, ledges, walls, ceiling, floor, decontamination unit, etc.) and has found no dust, debris, or lead containing material residue.

BY: (Contractor's signature)

Date

\_\_\_\_\_  
Print Name and Title

\_\_\_\_\_  
(Contractor's Onsite Supervisor Signature)

Date

\_\_\_\_\_  
Print Name and Title

\_\_\_\_\_  
(Contractor's Competent Person Signature)

Date

\_\_\_\_\_  
Print Name and Title

\_\_\_\_\_  
(Contractor's Certified Industrial Hygienist Signature)

Date

\_\_\_\_\_  
Print Name and Title

**CONTRACTING OFFICER ACCEPTANCE OR REJECTION**

The Contracting Officer hereby determines that the Contractor has performed final cleaning and visual inspection of the decontaminated regulated work area (all surfaces including pipes, beams, ledges, walls, ceiling, floor, decontamination unit, etc.) and by quality assurance inspection, finds the Contractor's final cleaning to be:

\_\_\_\_ Acceptable

\_\_\_\_ Unacceptable, Contractor instructed to reclean the LBP control work area.

BY: Contracting Officer's Representative

Signature

Date

\_\_\_\_\_  
Print Name and Title

END OF SECTION

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## SECTION 02150 - CLEARING AND GRUBBING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A This work shall consist of clearing, grubbing, removing, burying, chipping, and otherwise disposing of vegetation and debris within the construction limits, except for such objects as are designated to remain or are to be removed in accordance with other sections of these specifications. This work shall also include the preservation from injury of vegetation and objects designated to remain. The work shall be classified as follows:

- 1 Clearing: Clearing shall consist of the felling of trees and disposal of stumps, brush, windfalls, logs, limbs, sticks, piles of sawdust, rubbish, debris, vegetation and other objectionable matter as shown on the drawings or that which interferes with construction.
- 2 Grubbing: Grubbing shall consist of the removal from the ground and the disposal of roots, stumps, stubs, together with duff, matted roots, and debris from the grubbing limits, as hereinafter defined.

#### 1.2 RELATED DOCUMENTS

- A Drawings and general provisions of Contract apply to work of this section.

#### 1.3 APPLICABLE PUBLICATIONS Not used.

#### 1.4 MATERIALS Not used.

### PART 2 CONSTRUCTION

- A Clearing and grubbing shall be done at such times and in such a manner that the surrounding vegetation, adjacent property, and anything designated to remain shall not be damaged. Dragging, piling, disposing of debris, and other work that may be injurious to vegetation shall be confined to areas that carry no vegetation or an area designated by the Contracting Officer on site. Areas designated for stockpiling by the Contracting Officer shall be returned to pre-construction or the condition specified in the plans and specifications after stockpiling is no longer required.
- B The Contractor shall avoid injury to trees, shrubbery, vines, plants, grasses, and other vegetation both growing inside the construction limits and on areas outside of the construction limits. The trees that are to remain shall be protected as follows:
- 1 Tree Protection: Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.
  - 2 Do not store construction materials, debris, or excavated material within drip line of remaining trees.
  - 3 Do not permit vehicles, equipment, or foot traffic within drip line of remaining trees.
  - 4 Do not excavate within drip line of trees, unless otherwise indicated.

- 5 Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
  - 6 Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
  - 7 Cover exposed roots with burlap and water regularly.
  - 8 Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.
  - 9 Coat cut faces of roots more than 1½ inches (38 mm) in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
  - 10 Cover exposed roots with wet burlap to prevent roots from drying out. Backfill with soil as soon as possible.
  - 11 Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by the Contracting Officer.
  - 12 Employ a qualified arborist, licensed in jurisdiction where Project is located, to submit details or proposed repairs and to repair damage to trees and shrubs.
  - 13 Replace trees that cannot be repaired and restored to full-growth status, as determined by the qualified arborist.
  - 14 Anticipated potential hazards, such as "widow makers", leaning trees (alive or dead), snags, and the like, within the construction limits shall be close-cut and removed.
- C Grubbing shall be confined to the area over which excavation is to be actively prosecuted within approximately 30 days following grubbing operations. Depressions caused by construction resulting from grubbing operations shall be made free-draining by backfilling with suitable material or grading to drain. Where scour is likely to occur, temporary erosion control settling basins shall be constructed prior to any scour occurring.
- D Not less than 15 days prior to disposing of material, the Contractor shall submit to the Contracting Officer a proposal describing the disposal sites. Materials from clearing and grubbing operations shall not be disposed of until the proposal is submitted.

### PART 3 EXECUTION

#### 1.1 CLEARING

- A Clearing shall be within the limits, necessary to complete the construction.
- 1 Trees, stumps, brush, shrubs, and other vegetation shall be cut off within six inches of the ground. Where feasible, trees shall be felled toward the center of the area to be cleared so they will not injure other trees or objects to remain.
  - 2 The Contractor shall remove dead vegetation, logs, stumps, limbs, sticks, piles of sawdust, rubbish or debris, and other undesirable matter existing on areas where live shrubbery, brush, or trees occur.

1.2 GRUBBING

- A Grubbing shall be within the limits necessary to complete the construction.
- B All stumps, roots, logs, or other timber more than three inches in diameter and all brush, matted roots, and other debris within the limits necessary to complete the construction shall be pulled or otherwise removed to a depth of not less than 18 inches below the original ground surface.
- C When authorized by the Contracting Officer, the Contractor may leave stumps and non-perishable, solid objects, provided they do not extend more than six inches above the ground line or low-water level.

1.3 METHODS OF DISPOSAL

- A The methods of disposal of all brush, stumps, windfalls, slash, timber, and all other debris resulting from clearing and grubbing operations shall be at a sanitary landfill or other suitable facility that can document they are capable of disposing the above-mentioned materials.
- B Burying: The disposal of refuse from clearing and grubbing areas by burying on-site shall not be permitted.
- C When the Contractor proposes to use a disposal area other than a sanitary landfill, he shall first obtain a written permit from the property owner on whose property the disposal is to be made. The permit, or a certified copy thereof, together with a written release from the property owner absolving the Government from any and all responsibility in connection with the disposal of material on the property shall be filed with the Government.

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## SECTION 02200 – TRENCH EXCAVATION AND BACKFILL FOR PIPELINES AND APPURTENANT STRUCTURES

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. This section of the specifications covers excavation, trenching and backfilling for pipelines and appurtenances, complete. This work shall consist of all necessary clearing, grubbing, and site preparation; removal of all material of whatever description that may be encountered; removal and disposal of debris; handling and storage of materials to be used for fill and backfill; all necessary bracing; shoring and protection; pumping and dewatering as necessary; all backfill, preparation of subgrades, and final grading, dressing and cleanup of the site

#### 1.2 TRENCH MAINTENANCE

- A. The Contractor shall, for a period of one year after completion and final acceptance of the work, maintain and repair any trench settlement which may occur and shall make repairs to any pavement, sidewalks or other structures, which become damaged as a result of backfill settlement.
- B. If the Contractor elects to perform such maintenance and repairs by force account with the Government or subcontract with others, he shall furnish the Government with a copy of such subcontract, authorization or evidence of his faithful intention to perform the work.
- C. In any case, the Contractor shall furnish a written statement of the method of maintenance he proposes to use. Final acceptance and payment will not be made without such statement.

#### 1.3 CONTRACTOR'S SAFETY RESPONSIBILITIES

- A. Whether utilizing Type 1 or Type 2 trench excavation, the Contractor shall be responsible for enforcing safety and maintaining safe working conditions in all trenching, and shoring operations to conform to OSHA regulations.
- B. The Contractor shall employ qualified, properly trained personnel to design shoring, perform safety inspections of the trenches and other operations involving safety procedures, as specified by OSHA.

#### 1.4 TRAFFIC CONTROL AND WARNING DEVICES

- A. The Contractor shall pursue construction of the project in such a manner as to minimize the interruption of the use of roads, highways or streets involved and shall provide for emergency runs and fire hydrant access at all times.
- B. For the protection of traffic in public or private streets and ways, the Contractor shall provide, place, and maintain all necessary barricades, traffic cones, warning signs, lights, and other safety devices in accordance with the requirements of the "Manual of Uniform Traffic Control Devices, Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations", published by U.S. Department of Transportation, Federal Highway Administration (ANSI D6.1-latest edition). The Contractor shall take all necessary precautions for the protection of the work and the safety of the public. All barricades and obstructions shall be illuminated at night, and all lights shall be kept operational from sunset until sunrise. The Contractor shall station such guards or flagmen and shall conform to such special safety regulations relating to traffic control as may be required by the public authorities within their respective jurisdictions.

All signs, signals, and barricades shall conform to the requirements of Subpart G, Part 1926, of the OSHA Safety and Health Standards for Construction.

- D. The Contractor shall prepare a traffic control plan for the project corresponding to the time schedule and plan of construction for the project. The traffic control plan shall be submitted to the Contracting Officer for review.

#### 1.5 PROTECTION OF EXISTING PROPERTIES AND UTILITIES

- A. General: Prior to beginning construction, the Contractor must contact (in writing) all utility companies and/or public utilities having underground installations - sewer, telephone, water, fuel, gas, electric, cable television, etc., that may be encountered during the excavation. A copy of each notice to the utility company must be provided to the Contracting Officer. The Contractor must locate any underground installations and shall preserve intact any underground pipes or other utilities encountered during construction (except as hereinafter permitted) provided their location is such that they do not interfere with new pipelines or structures being installed. In case such utilities or other structures are accidentally broken, they shall be immediately replaced (at the Contractor's expense) in a condition conforming to the standard repair practice of the utility.
- B. Existing water mains or water services which will intersect with the new pipelines or structures including those not shown on the plans will be relocated by the Contractor when the relocation is authorized in writing. In the event the Contractor is authorized in writing by the Government to relocate the water mains, payment will be made as specified in Measurement and Payment.
- C. Existing water services from the mains to private property which interfere with trenching operations may be cut and replaced at the Contractor's option and expense. The use of such water service shall in no case be interrupted for more than four hours, unless specifically permitted in writing by the user.
- D. Existing water mains and water services shall be protected from freezing at all times during construction operations.
- E. Provide Temporary Water Service: During construction, when water service is interrupted during connections to existing mains, and adjustment of water mains, adjustment of water service lines, or other interruptions resulting from construction, the Contractor shall notify the Contracting Officer as to which services will be affected. If service is interrupted for a period of time greater than four hours, the Contractor shall make arrangements to provide temporary service to the properties affected, if required by the Contracting Officer.
- F. The preferred method of providing temporary service is with above ground piping connected to fire hydrants. The Contractor shall provide all pipe, hose, valves and incidental material to complete all connections. The service shall be capable of providing 5 gpm at the service point of connection. If the Contractor elects to use the existing main, he shall be responsible for maintenance of the main and service line until the new main is placed into service.
- G. The Contractor shall provide a plan for providing temporary service corresponding to his construction program.

#### 1.6 MAINTENANCE OF FLOWS:

- A. Adequate provisions shall be made for maintaining the flow of sewers, drains, ditches, and water courses encountered during construction.

#### 1.7 STRUCTURES

- A. The Contractor shall exercise precaution to prevent damage to existing buildings, culverts, ditches, fences, or other structures in the vicinity of the work. In the event such damages occur, he shall repair them to the satisfaction of the Government of the damaged structure and at no cost to the Government unless a specific pay item for the work is provided in the contract proposal.

#### 1.8 OVERHEAD UTILITIES

- A. The Contractor shall use caution to avoid a conflict, contact or damage to overhead utilities, such as power lines, street lights, telephone lines, television lines, poles or other appurtenances during the course of construction of this project.

#### 1.9 PAVEMENT REMOVAL

- A. Where trench excavation or structure excavation requires the removal of curb and gutter, concrete sidewalks, or asphaltic or concrete pavement, the pavement or concrete shall be cut in a straight line parallel to the edge of the excavation by use of a spadebitted air hammer, concrete saw or similar approved equipment to obtain a straight, square, clean break.
- B. Survey Markers and Monuments: The Contractor shall use care and precaution to protect and not disturb any survey marker or monuments, such as those that might be located at a lot or block corners, property pins, street intersection monuments or additional line demarcation. Such protection shall include marking with flagged high lath and close supervision. No monuments shall be disturbed without prior approval of the Contracting Officer. Any survey marker or monument that is disturbed or destroyed by the Contractor without approval during the construction of this project shall be replaced at no cost to the Government by a licensed land surveyor.

#### 1.10 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

#### AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) PUBLICATIONS

AASHTO T-88	Particle Size Analysis of Soils
AASHTO T-89	Determining the Liquid Limit of Soils
AASHTO T-90	Determining the Plastic Limit and Plasticity Index of Soils
AASHTO T-180	Moisture-Density Relations of Soils Using a 10-lb Rammer and an 8-inch Drop
AASHTO T-238	Density of Soil and Soil Aggregate In-Place by Nuclear Methods (Shallow Depth)
AASHTO T-239	Moisture Content of Soil and Soil Aggregate In-Place by Nuclear Methods (Shallow Depth)

#### DEPARTMENT OF LABOR, SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION (OSHA) PUBLICATIONS

OSHA 29 CFR 1926	Excavations; Final Rule October 31, 1989
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#### DEPARTMENT OF TRANSPORTATION UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS

#### PART 2 - MATERIALS

#### 2.1 TYPE 1 BEDDING MATERIAL

1. This bedding material shall consist of sand, sandy gravel or fine gravel conforming to the following gradation when tested in accordance with AASHTO Method T-88.

U.S. Standard	
(Sieve Size)	Percent Passing
1 inch	100
No. 4	25 - 80
No. 200	0 - 10

2. That portion passing the No. 40 sieve shall have a maximum plasticity index of 6 when tested in accordance with AASHTO Methods T-89 and T-90.

## 2.2 TYPE 2 BEDDING MATERIAL

1. Type 2 bedding material shall consist of suitable granular material conforming to the following gradations:

U.S. Standard	
(Sieve Size)	Percent Passing
3"	100
1-1/2"	70 - 85
No. 4	25 - 50
No. 200	0 - 12

2. The material passing the No. 40 sieve shall have a maximum plasticity index of 6 when tested in accordance with AASHTO Methods T-89 and T-90.

## 2.3 PLASTIC MARKING TAPE

1. The tape shall be acid and alkali-resistant polyethylene film, 6 inches wide with minimum overall thickness of 5.0 mils and shall include a solid aluminum core. Tape color shall be as specified in Table 1 and shall bear a continuous printed inscription describing the specific utility.

TABLE 1 TAPE COLOR	
Red	Electric
Yellow	Gas, Oil, Dangerous Materials
Orange	Telephone, Telegraph, Television, Police and Fire Communications
Blue	Water Systems
Green	Sewer Systems

## PART 3 - CONSTRUCTION AND/OR INSTALLATION.

### 3.1 STRIPPING

- A. When crossing existing or prospective cultivated areas or other developed surfaces, the Contractor shall strip the cover material to full depth at the existing surfacing. Topsoil shall be stockpiled and placed back over the trench after backfilling of the trench. Topsoil shall be removed to full depth of the topsoil, or to a maximum depth of 12 inches, whichever is less. Asphalt pavement removed when broken into pieces not larger than six inches in diameter may be included in the backfill. Large pieces of asphalt paving and all concrete pavement shall be removed to the disposal site.
- B. All established lawn areas damaged during the course of the work shall be re-sodded and the cost borne by the Contractor, except where re-sodding is paid for under a separate pay item as listed in the proposal form.

### 3.2 TRENCH EXCAVATION

- A. General: All excavation, trenching and shoring, and the like, under this contract shall be performed in a manner that meets with the requirements of OSHA Manual.

1. The Contractor shall excavate as necessary at the locations shown on the drawings, staked in the field or otherwise specified for the installation of pipelines. Excavations shall be made at each location by one of the two methods specified herein - either Type 1 or as Type 2 Trench Excavation. Type 1 Trench Excavation will be used in most open areas. Type 2 will be used when space limitations or other conditions dictate. Areas of Type 1 and Type 2 Trench Excavation are designated on the plans.
  2. Whether trench excavation is classified as Type 1 or Type 2, the Contractor shall take precautions and protect all adjoining private and public property and facilities, including underground and overhead utilities, curbs, sidewalks, driveways, structures, and fences. Any disturbed or damaged facilities will be restored or replaced at no cost to the Owner.
  3. All trench excavation shall be made by open cut methods.
  4. When the Contractor removes a portion of the sidewalk or curb, he must use a concrete saw for making neat joints, or remove the concrete to the nearest contraction joint. The Contractor shall compact the backfill as specified, and pour a new concrete sidewalk or curb section.
  5. When concrete pavement is removed, it shall be saw cut on each side of the trench for a total width not to exceed two feet wider than the pay width for Type 2 Excavation.
  6. During excavation, materials suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. Excavated material shall be piled on one side of the trench only, to permit ready access to existing fire alarm boxes, fire hydrants, valves, manholes and other appurtenances. Surface drainage of adjoining areas shall be unobstructed.
  7. All excavated materials not required or suitable for backfill shall be removed from the site and wasted in accordance with Subsection 4.03D.
  8. Grading shall be done as may be necessary to prevent surface water from flowing into the excavation, and any other water accumulating therein shall be promptly removed. No water shall be permitted to rise in unbackfilled trenches until after the pipe has been placed, tested and covered with backfill for a depth of at least two feet. Any pipe having its alignment or grade changed as a result of a flooded trench shall be removed and relaid after the trench is regraded at no additional cost to the Government.
  9. The bottom of the trenches shall be accurately graded to the line and grade shown on the drawings. Bedding material shall provide uniform bearing and support for each section of the pipe at every point along its entire length. Unauthorized over-excavation shall be backfilled with pipe bedding material at the Contractor's expense.
  10. There will be no differentiation of materials in trench excavation. Excavation shall include the removal and subsequent handling of all earth, gravel, rock, pavement or other material encountered regardless of the type, character, composition or condition of the material.
  11. When rock is encountered, the Contractor shall excavate the rock to a depth of at least six inches below the bottom of the pipe.
  12. The Contractor will be required to conduct his work so that trenches will remain open a minimum possible time. No trench excavating shall begin until approved compaction equipment is at the site where the excavating is to take place. All backfill and compaction shall be completed in all trenching and structural excavations within a maximum distance of 400 feet behind the end of newly installed pipe and the maximum distance between the newly installed pipe and the excavator shall be 300 feet. For each work group consisting of a trench excavator, a pipe laying crew, and a backfilling and compacting crew, the maximum allowable open ditch at any time will be 600 feet. The maximum distance behind the end of the new pipe shall be 1,000 feet for gravel replacement or for base and pavement replacement. Certain conditions, as provided in the General Requirements of these specifications, may necessitate the closing of certain sections of trench prior to daily, weekend or holiday shutdown.
- B. Type 1 Trench Excavation: Excavation performed as Type 1 will not be shored or sheeted. The sides of all trenches shall be sloped back to preclude collapse, in accordance with OSHA Regulations.

- C. Type 2 Trench Excavation: Excavation performed as Type 2 shall be adequately shored and sheeted in accordance with the minimum requirements of OSHA Regulations.
  - 1. Portable trench boxes or sliding trench shields may be used for performing Type 2 Excavation in lieu of a shoring system if they are designed, constructed, and maintained in a manner which will provide protection equal to or greater than the sheathing or shoring required for the trench.
- D. Trench Dimensions: Trench dimensions shall be as specified below.
  - 1. Width. The width at the bottom of the trench shall be such to provide adequate working room for men to install and join the pipe in the specified manner. The width of that portion of the trench from the existing ground surface to the bottom of the trench for Type 2 Trench Excavation or from the bottom of the trench to a maximum of five feet above the bottom of the trench for Type 1 Trench Excavation, shall be as follows:
    - 2. For pipe sizes 12 inch diameter and smaller, a minimum width of 3.5 feet and a maximum width of 4.5 feet.
    - 3. For pipe sizes larger than 12 inch diameter, a minimum width of 2 feet plus the outside diameter of the pipe and a maximum of 3.5 feet plus the outside diameter of the pipe.
    - 4. For Type 2 Excavation, the width of the trench at the surface shall not exceed the bottom trench width by more than 2 feet.
- E. Depth of Trench. Trench depth shall be as required for the pipe grade or pipe cover shown on the plans or as specified elsewhere, plus an additional 4 inches for Type 1 pipe bedding.
  - 1. Care shall be taken not to excavate below the required depth. In areas with rock subgrade, the Type 1 pipe bedding depth shall be a minimum of 6 inches.
  - 2. When soft or unstable material is encountered at subgrade which will not uniformly support the pipe, such material shall be excavated to an additional depth as specified by the Contracting Officer, and backfilled with Type 2 bedding material to provide a firm foundation for the pipe.
- F. Blasting: Blasting for excavation will not be permitted.
- G. Equipment: Trenching machinery will be used except in places where its operation will cause damage to existing structures or features, in which case hand methods shall be employed.
  - 1. Any equipment operating on tracks, which is to be used on pavement, shall be equipped with suitable pads to prevent damage to the pavement. All pavement damaged during construction by the Contractor's equipment shall be restored to its original condition by the Contractor. No compensation will be allowed for pavement replacement other than as specified in the plans and specifications.
- H. Dewatering: Where groundwater is encountered in excavation, it shall be removed to avoid interfering with pipe laying and other construction operations. Groundwater shall not be permitted to enter water main or sanitary sewer collection systems.
- I. Drainage: The Contractor shall control the grading in the vicinity of trenches and structures as much as possible so that the ground surface is properly sloped to prevent water from running into excavated areas. Water which has accumulated in the excavation from rainfall and/or surface runoff, or from any other cause, shall be removed by the Contractor at his expense, and the subgrade shall be restored to proper bearing capacity. The Contractor shall not allow drainage water to flow onto or across adjoining private or public property, except with written permission of the Government.
- J. Surface and Groundwater Disposal: Any trench area or excavation that could allow surface water or trench dewatering water to reach a flowing stream shall require the following:
  - 1. Dewatering water or surface water containing silt, oil, or other matter shall be diverted into a treatment system allowing for sedimentation and filtration in order to obtain proper water quality upon prior to discharge to surface waters. Such systems shall meet the

Montana Fish, Wildlife and Parks Department requirements and will be approved by that agency prior to their use. Any operation not meeting these requirements shall be subject to shutdown of the project.

2. Shoring, Sheeting, and Bracing: The Contractor shall do all shoring, bracing and tight sheeting required to prevent caving and to protect his workmen, in accordance with Occupational Safety and Health Regulation Requirements, and to protect adjacent property and structures. If surface cracking occurs in the vicinity of the trench, sloughing of the trench wall or horizontal deflection of shoring occurs, the Contractor shall stop excavation operations and shall provide shoring or additional shoring to protect the project, workmen and adjoining property.
3. Tight Sheeting Ordered Left in Place: In areas where quicksand or other unstable material is encountered which requires the driving of tight sheeting to protect the work and workmen, the sheeting may be required to be left in place. If the withdrawal of the sheeting would result in damage to the work or any surrounding property, it shall be left in place. In the event that removal of tight sheeting should result in personal injury or property damage of any kind, the fact that the sheeting was not ordered to be left in place shall in no way relieve the Contractor of his responsibility for protecting the work as described in the General Conditions of these specifications. This item does not include intermittent shoring and bracing.
4. Excavation for Appurtenances: Excavations for manholes, hydrants, structures and other appurtenances shall be sufficient to leave 18 inch minimum clearance on all sides. The depth, provisions for removing water, and other applicable portions of these specifications shall apply to excavation for appurtenances.
5. Structural Excavation: Excavation for structures shall extend a sufficient distance from walls and footings to provide for forming except where concrete for footings is authorized to be deposited directly against excavated surfaces. Avoid excavating below the depths indicated on the drawings. Over-excavation shall be restored to proper elevation by filling with granular bedding material at the Contractor's expense and compacted to 90% of maximum dry density as determined by AASHTO T-180.

### 3.3 TRENCH BACKFILL

#### A. GENERAL

1. All trenches shall be backfilled immediately after grade, alignment and jointing of the pipe has been inspected and approved by the Contracting Officer's Representative. Leakage tests, pressure tests or tests for alignment and grade shall be performed after backfill. If any test fails, the Contractor shall be responsible for work required to correct the defects at no additional cost to the Government. Backfill density shall be determined in accordance with AASHTO T-238 and T-239 methods of testing.

#### B. PIPE BEDDING MATERIAL

1. Type 1, Pipe Bedding. Type 1 pipe bedding material shall be placed to a minimum depth of four (4) inches under the pipe except in trenches cut in rock requires six (6) inches under the pipe. The material shall be placed up to the centerline of the pipe. Bell holes and depressions for joints shall be dug after the trench bedding has been graded and compacted. The holes shall be only of such length, depth and width as is required for properly making the particular type joint.
2. Type 2, Pipe Bedding. Type 2 bedding material shall be used to replace soft, spongy, or other unsuitable material encountered in trench bottom below the Type 1 pipe bedding material level, to the depth necessary to support the pipe as determined by the Contracting Officer's Representative.
3. Bedding Compaction. The pipe bedding material shall be placed in lifts not exceeding six (6) inches in depth and compacted to 90% of maximum dry density as determined by AASHTO T-180.

### 3.4 BACKFILL:

- A. General. The fill material above the bedding material and to a minimum distance of 6 inches above the pipe shall be a select backfill material meeting the following requirements:
1. The select material shall be free of clods, lumps of frozen material, or stones larger than one inch in their maximum dimension.
  2. The select material for flexible pipe such as polyvinyl chloride, polyethylene, corrugated steel, or corrugated aluminum shall have no more than 35 percent of the material passing the No. 200 sieve. The portion of the material passing the No. 40 sieve shall have a maximum liquid limit of 40 and a maximum plasticity index of 10. All material shall be inorganic. The select material for rigid pipe such as ductile iron, concrete, steel, or asbestos cement shall have a maximum liquid limit of 40 and a maximum plasticity index of 15 based on that fraction of the material passing the No. 40 sieve. All material shall be inorganic.
  3. Where suitable material is available in the material excavated from the trench, the Contractor may procure the select material by screening, sifting, or manually sorting the material removed from the trench. The particle size, liquid limit, and plastic limit shall be determined in accordance with AASHTO T-88, AASHTO T-89 and AASHTO T-90.
  4. After the pipe bedding and select backfill material has been placed and compacted as specified, the remainder of the trench backfilling shall be done. All backfill material shall be free from cinders, ashes, refuse, organic and frozen material, boulders, or other materials that are unsuitable. From six inches above the top of pipe to six inches below the ground surface, or to the subgrade elevation for streets or paved surfaces, material containing stones up to six inches in the greatest dimension may be used. Stones shall be placed so that each piece is completely surrounded with material compacted to the density hereinafter specified.
  5. Trench backfill compaction is separated into two classifications. Type A trench backfill compaction is required for backfill in streets or paved areas or other selected areas as designated on the drawings. Type B backfill compaction is designation for fields, borrow pits, or other unsurfaced areas where Type A backfill compaction is not required. Locations of the types of backfill required shall be as shown on the drawings.
  6. Compaction by flooding will not be permitted. Wherever the trenches have not been properly filled, or if settlement occurs, they shall be re-opened to the depth required for proper compaction and refilled and recompact.
  7. The Contractor shall provide excavation equipment and dig compaction test holes through each layer of backfill at approximately 100 foot intervals and all service lines and hydrant leads as selected by the Contracting Officer, where the layers exceed one foot in depth or where backfill was placed without the Contracting Officer being present. The compaction test holes shall be dug by the Contractor at no additional cost to the Government. Should the tests fail, the Contractor shall excavate the trench to the required depth for recompaction and shall recompact the backfill material at no additional expense to the Government.
  8. Pipelines will be checked to determine whether any displacement or other damage has occurred after the trench has been backfilled approximately two feet above the pipe. If the pipelines show poor alignment, breakage, excessive leakage or any other defects, the deficiencies shall be corrected by the Contractor at his expense.

### 3.5 BACKFILL COMPACTION

- A. Select Backfill Zone.
1. The bedding and select material under, around and six inches above the top of the pipe shall be placed by hand in maximum layers of six inches and carefully compacted in a manner which will not displace the pipe. Special care shall be taken to assure complete compaction under the haunches of the pipe. Backfill material shall be placed in the trench for its full width on each side simultaneously. Compaction of the select backfill shall be not less than 90% of the maximum density as determined by AASHTO T-180.
  2. Water settling will not be allowed, and the addition of water shall be limited to that required for optimum moisture for maximum compaction of the material.

- B. Type A Trench Backfill Compaction.
  - 1. Materials used for backfill shall be carefully deposited in layers suitable to the equipment used for compaction, wetted to optimum moisture content, and compacted to at least 90% of maximum Modified Proctor Density, as determined by AASHTO T-180.
  - 2. The upper 6 inch layer forming the subgrade for pavement which is to be replaced shall be compacted to a density of at least 95% of maximum Modified Proctor Density, as determined by AASHTO T-180.

### 3.6 TYPE B TRENCH BACKFILL

- A. Backfill to at least six inches above the pipe shall meet the requirements of Select Backfill. Materials used for Type B Trench Backfill shall be compacted in layers to a density of at least 90% of maximum Modified Proctor Density, as determined by AASHTO T-180.
  - 1. In open uncultivated areas, the Contractor shall be required to mound excess earth over the top of the trench. In cultivated areas, the stripped topsoil shall be placed to a uniform depth over the mounded backfilled trench. The topsoil shall not require compaction, but shall be graded to provide a smooth surface.
- B. Backfilling for Appurtenances and Structures: Backfill around appurtenances and structures shall be deposited in a manner that does not disturb the appurtenances or structure from its proper alignment, and compacted to the finished grade. Backfill material, compaction and backfill procedures shall conform to the requirement specified for trenches of pipelines joining such appurtenances and structures.
- C. Plastic Marking Tape: Warning tapes shall be installed directly above the pipe, at a depth of 18 inches below finished grade unless otherwise shown.
- D. Embankment above Original Ground for Minimum Cover Requirements: Where shown on the plans, the Contractor shall provide embankment over the pipe above the original ground surface to a height which will satisfy the minimum depth requirements. Such embankment shall be constructed to the cross section shown on the plans.
- E. Disposal of Excess Material: Excess materials, including rock, broken concrete, bituminous materials, debris or other materials not suitable for backfill shall be removed from the site. It shall be wasted in the designated disposal areas directed by the Contracting Officer. When disposal sites are not designated by the Contracting Officer, the Contractor shall provide the site. The site must meet regulatory provision for waste disposal. The disposal sites meeting regulatory requirements may be used provided written permission is obtained from the Government of the property upon which the material is to be deposited. The Contractor shall provide the Contracting Officer with a copy of the written permission. After all waste material has been placed in the disposal site, the Contractor shall grade the site to leave the surface in uniform and free draining condition.
- F. Testing: Field density tests of the compacted fill will be run at all levels. These tests will be performed by the Contracting Officer's Representative.

### 3.7 CLEANUP

- A. As work progresses, that portion of the work completed shall be cleared of debris and brought to the finished grade. Upon completion of the work, the entire site shall be cleared of all debris and ground surfaces shall be finished smooth with uniform slopes and shall present a neat and workmanlike appearance. All rocks brought to the ground surface by excavation or backfilling operations shall be removed. All pavement shall be thoroughly cleaned of all dirt, mud, and rock deposited during the course of construction.

END OF SECTION 02200



SECTION 02205– SITE GRADING, EXCAVATION, BACKFILL AND EMBANKMENT FOR STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall perform all grading, excavation, backfill and embankment work required on the site to the lines, dimensions, contours and elevations indicated on the drawings. This work shall include structural excavation, site grading, trenching, preparation of subgrade, preparation of foundations, materials removal and disposal of brush, trees, and debris, providing for all necessary sheeting, shoring and protection of the excavations, pumping and dewatering as necessary or required, compacting structural and trench backfill, stabilizing foundation areas including importing and placing selected materials, stabilizing subgrades including stripping and compacting, and the construction of embankments, either loose or compacted, final grading, dressing and cleanup of the site as required by the plans and specifications.

1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of these specifications to the extent referenced. The publications are referred to in the text by the basic designation only.
- B. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO):
- C. AASHTO T-88 Particle Size Analysis of Soils
- D. AASHTO T-89 Determining the Liquid Limit of Soils
- E. AASHTO T-90 Determining the Plastic Limit and Plasticity Index of Soils
- F. AASHTO T-180 Moisture-Density Relation of Soils Using a 10-LB. Hammer and an 18-In. Drop
- G. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA):
- H. OSHA 29 CFR 1926 Excavations; Final Rule October 31, 1989

PART 2 - MATERIAL

2.1 UNDER SLAB GRAVEL

- A. The fill material shall be a low permeable, non-swelling material and shall consist of clean, hard, durable particles which have been screened and crushed to the following gradation:

% Passing by Weight

Sieve Size	Min.	Max.
3"	100	
No. 4		20
No. 200	2	10

## 2.2 BORROW:

- A. Where borrow excavation is necessary, the material shall be obtained from borrow areas off site. The Contractor shall make all necessary arrangements to obtain the additional borrow material from other sources, including all royalty and other charges involved. Borrow material shall be selected to meet the requirements and conditions for backfill or embankment for which it is to be used. All borrow materials shall be approved by the Contracting Officer prior to depositing on the site. Upon completion of the work, all borrow areas, whether on or off the site, shall be left in a neat and workmanlike condition. All borrow areas shall be left free draining unless specifically treated as a "pond" with the approval of the Government.

## PART 3 - EXECUTION

### 3.1 CLASSIFICATION OF EXCAVATION:

- A. All excavation shall be unclassified and shall consist of all materials encountered, including materials in filled areas.

### 3.2 CONSERVATION OF TOPSOIL:

- A. The Contractor will be required to conserve the topsoil. Topsoil shall be carefully removed to a maximum depth of 12 inches or the full depth of the topsoil, whichever is less, and spread on areas already graded and prepared for topsoiling, or deposited in storage piles convenient to the area which will subsequently receive topsoil. Topsoil, when stored, shall be kept separate from other excavated material and shall be piled free from roots, stones and other undesirable material. Topsoil shall be removed in an operation separate from the trench and structural excavation operation.

### 3.3 SITE PREPARATION:

- A. Topsoil: The topsoil shall be removed, stockpiled and conserved for potential placement in landscaped and nonstructural areas. Areas to be topsoiled shall be backfilled or graded four inches below grade and refilled with topsoil to grade.
- B. Trees and Shrubs: All areas to be excavated and all areas adjacent to new construction shall be cleared of trees, bushes, hedges and miscellaneous items as indicated on the drawings and in accordance with Section 02150.
- C. Pavement Removal: Existing pavement shall be removed as indicated on the drawings or as otherwise required to complete construction.
  - 1. Existing pavement, consisting of bituminous surface course on rock or gravel base, shall be removed as part of the excavation. The pavement surface course along the edge of the pavement which is to remain shall be cut in a straight line so as to provide a reasonably straight and square edge for joining with the new surface course material.
- D. Curb and Sidewalk Removal: Existing sidewalk, straight curbs and curb and gutter shall be removed as indicated on the drawings or as marked for removal by the Engineer. Existing sidewalks and curbs which are to be removed shall be saw cut to a depth of approximately two inches and then broken out.

### 3.4 EXCAVATION TO GRADE:

- A. Excavation shall be made to the grade shown on the drawings. Care shall be taken to insure that no excavation is made below grade or beyond the dimensions of the planned excavations. In the event

that excavating is made beyond the above limits, the Contractor shall replace the excavated materials and compact the replaced material in accordance with Subsection 4.07 at no additional cost to the Government.

### 3.5 SUBGRADE PREPARATION:

- A. Subgrade material shall be defined as the soil or other natural existing material in the area which supports the subbase or base courses for pavements, curbs, sidewalks and parking areas or other structures.
- B. Curb and Gutter: Concrete curb and gutter shall be placed directly on at least 6 inches of under slab gravel. Prior to gravel placement, the top six inches of the subgrade shall be compacted to 95 percent of the maximum dry density as determined by AASHTO T-180. After compaction the subgrade shall be cut to finish grade.
- C. Walks: The subgrade under walks shall be carefully prepared and compacted and where existing subgrade material is unsuitable as a foundation material for sidewalks or drives, the unsuitable material shall be removed and replaced with satisfactorily compacted material. Subgrades under drives and sidewalks shall be compacted to at least 95 percent of the maximum dry density as determined by AASHTO T-180. After compaction the subgrade shall be cut to finish grade. At least 6 inches of under slab gravel shall be placed on the prepared subgrade.
- D. The subgrade shall be compacted for a depth of six inches to 95 percent of the maximum dry density as determined by AASHTO T-180.

### 3.6 SUBGRADE PROTECTION

- A. During construction, subgrades and excavations shall be kept shaped and drained. Ditches and drains along the subgrade shall be maintained to drain effectively at all times. Where ruts occur in the subgrade, the subgrade shall be re-established to grade, reshaped and recompact prior to the placing of granular material, all at no additional cost to the Government. The storing or stockpiling of materials on the subgrade will not be permitted. No granular fill shall be laid until the subgrade has been inspected and approved. Under no circumstances shall granular material be placed on a muddy subgrade.

### 3.7 FILL:

- A. Where fill is required, the fill shall be composed of sound earth, sand or gravel, free from vegetable matter or other objectionable foreign material. No stones having a maximum dimension greater than six inches shall be placed in a fill. The area to receive fill shall be stripped of all vegetation and other unsuitable material before fill is placed. Slopes shall have surfaces broken up in such a manner that fill material will bond with existing surface. The fill shall be placed in layers not exceeding six inches. In structural areas, the material in each layer shall be moistened-conditioned and shall be compacted to at least 95 percent of the maximum dry density as determined by AASHTO T-180. In nonstructural areas, such as landscaping, compaction to 90 percent is required. Wherever possible, all fill material shall be obtained from the excavation area.

### 3.8 FINISH GRADING OF SITE:

- A. Promptly after completion of paving or other construction, the areas next to the improvements shall be shaped in accordance with the contours shown on the drawings, and brought to a uniform, smooth grade. Fill material placed in such areas shall be free from stones, sticks or other materials which will

be objectionable for seeding or sodding purposes. The Contractor shall maintain the area until final acceptance of the project.

3.9 WATER:

- A. Water shall be applied to the subgrade, fill or granular material to facilitate compaction.

3.10 GROUND WATER:

- A. The Contractor should satisfy himself as to the condition of ground water prior to submission of his bid. When ground water is encountered in the structure or trench excavation, the Contractor shall provide for dewatering as required to provide for stability and firmness of the foundation below static water level. Such lowered water level shall be maintained until such time as the work is sufficiently advanced to be secure from damage by wetting. In areas where structural backfill or compacted embankment is required, the excavation shall be free of water prior to start of backfill material.

3.11 DRAINAGE:

- A. The Contractor shall control the grading in the vicinity of structures and trenches as much as possible so that the ground surface is properly sloped to prevent water from running into excavated areas. Water which has accumulated in the excavation from rainfall and/or surface runoff, or from any other cause, shall be removed by the Contractor at his expense, and the subgrade shall be restored to proper bearing capacity.

3.12 SURFACE AND GROUNDWATER DISPOSAL:

- A. Any trench area or excavation that could allow surface water or trench dewatering water to reach a flowing stream shall require the following:
  - 1. Dewater or erosive water shall be diverted into a system allowing for sedimentation and filtration to maintain water qualities upon discharge to surface waters. Such proposals shall meet the requirements of the Montana Fish, Wildlife and Parks Department and will be approved by that agency prior to their use. Any operation not meeting these requirements shall be subject to shutdown of the project. All cost associated with sedimentation and filtration will be incidental to the bid.

3.13 STRUCTURAL EXCAVATION AND TRENCHING:

- A. All excavation of every description and of whatever material encountered shall be performed as required by the lines and grades indicated on the drawings in accordance with this specification and specification Section 02200. Where no specific limits of excavation for structures or trenches are called for, the excavation shall be accomplished in accordance with standard practices pertinent to the work being performed. The excavation shall be held to the minimum required for proper performance of the work. Where excavation is being performed in unstable materials subject to sliding or "cave-in", the Contractor shall provide and use whatever sheeting, shoring or cribbing as may be required to properly protect the work and insure safe working conditions. Where excavation requires hazardous operations, the Contractor shall exercise due care to protect all adjacent property, both public and private, and shall protect the Government from all claims resulting from these operations. All excavation, trenching, and shoring, and the like, under this contract shall be performed in a manner that meets with the Department of Labor, Safety and Health Regulations for Construction in accordance with OSHA Manual 2085, "Safe Practice for Excavation and Trenching Operations".

- B. All suitable material removed from the excavations shall be used, insofar as possible, in the formation of embankments, fills, backfilling, and for such other purposes as may be called for on the plans.
- C. Material deemed unsuitable for these purposes shall be disposed of at an approved Landfill site.
- D. The Contractor is expected to familiarize himself completely with the type of excavation to be performed and type of material to be handled. No consideration of claims for extra compensation due to encountering difficult or unstable material in the excavation will be made.

3.14 BACKFILLING AROUND STRUCTURES:

- A. Backfilling around structures shall be accomplished using only earth materials free from roots, wood, broken concrete, frozen chunks, or debris of any kind. Prior to backfilling, the excavation shall be cleaned of all debris and dewatered. In addition, the earth bank will be stepped to avoid a vertical sheer plane.
- B. Compaction in Areas Not Under Slab: The backfill material shall be placed in uniform horizontal layers of a depth suitable for the compaction equipment the full width of the excavation, brought to proper moisture content, and thoroughly compacted, using hand or mechanical tampers prior to placing the next layer. The materials shall be compacted to a density equal to 90% of Proctor Density specified in Paragraph 2.01. Should the backfill material be too wet or too dry, drying or wetting prior to placement in the excavation shall be required. The work shall be performed in such a manner that when finished, the entire backfill shall have a uniform density.
- C. Compaction Under Slabs, Driveways, and Buildings: Borrow and backfill materials shall be carefully deposited in layers suitable to the equipment used for compaction and wetted in optimum moisture content and compacted to at least 95% of maximum Proctor Density, as determined by AASHTO T-180.
- D. The upper 6 inch layer forming the subgrade for slabs which is to be replaced shall be compacted to a density of at least 100% of the maximum Proctor Density specified. Compaction by inundation will not be permitted.

3.15 SUBSOIL STABILIZATION:

- A. In areas where a firm foundation is required, such as under all concrete structures, the subsoil shall be firm and compact prior to further construction. Should the subsoil in any area be mucky or work into mud under the feet of the workmen, it shall be stabilized by replacing the mucky or muddy material with one or more thin layers of crushed stone or other granular material embedded into the foundation material. A sufficient quantity of granular material shall be added and embedded into the subsoil to make it firm and compact.
- B. Should the subsoil for structures be classed as unsuitable for foundation subgrade, it shall be completely removed and replaced with suitable material. Where dewatering is required to obtain a firm foundation, the Contractor shall dewater the area and maintain this condition until a satisfactory foundation has been prepared and the concrete or other material can be placed in accordance with the plans and these specifications. Suitable material shall be a pit run gravel having a P.I. of not more than 8, or equal.

3.16 ROADWAY AND WALKS:

- A. Subgrade Preparation. Subgrade material shall be defined as that soil or other natural existing material which supports the base material.

- B. Excavation for roadways, driveways, and walks shall be cut approximately one inch above subgrade. The subgrade shall then be scarified thoroughly to a depth of 4 inches below the finished subgrade, surface moistened with water if necessary to obtain a moisture content 2% to 5% above optimum, mixed to provide uniform composition across the width of the pavement, and recompact to a dry density of at least 95% of maximum dry density, as determined by AASHTO Method T-180.
- C. Where spongy or unsuitable areas are encountered which will not provide a suitable subgrade for the roadway, driveways or walks, the unsuitable material shall be removed and replaced with suitable material and compacted as provided above. After compacting, the subgrade shall be cut to finish grade as necessary to complete the construction.

3.17 GRADING:

- A. After construction is finished and all backfilling is completed, all areas within the work sites shall be graded to match pre-construction grades or new grades shown on the drawings. The work shall be performed so that when finished, there will be no drainage pockets and the finished embankments, dikes, ditches and roadways shall be to the true elevations and dimensions shown on the drawings.
- B. After the grading has been finished, the entire area shall be cleared of all debris such as construction scraps, brush, paper and salvaged materials, and the site of the work left with a neat appearance.

3.18 UNDERGROUND OBSTRUCTIONS:

- A. The Contractor shall preserve intact any underground pipes or other utilities that are encountered during construction and which are to remain in service. In case any such utilities or other structures are accidentally broken, they shall be immediately replaced by the Contractor in a condition at least equal to that in which they were found.

3.19 DISPOSAL OF EXCESS MATERIAL:

- A. Excess material such as topsoil, trees, brush, excavation, rock, broken concrete, bituminous materials, debris or other materials not suitable for backfill or fill, shall be removed from the site and wasted in an approved landfill. Other disposal areas for concrete may be used by the Contractor provided written permission is obtained from the Government of the property upon which the material is to be deposited. After all waste material has been placed in the disposal site, the Contractor shall grade the disposal site to leave the surface in a uniform, free draining condition.

3.20 CLEANUP:

- A. Excess material will not be permitted to be accumulated and shall be removed concurrently with the finishing operation. Care will be taken to prevent the entrance of the material into drainage structures, other waterway, or storm sewers during the construction period.

END OF SECTION 02205

## SECTION 02240 - DEWATERING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes construction dewatering.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control ground-water flow into excavations and permit construction to proceed on dry, stable subgrades.

#### 1.3 SUBMITTALS

- A. Shop Drawings for Information: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of headers and discharge lines; and means of discharge and disposal of water.
  - 1. Include Shop Drawings approved by the Contracting Officer.

#### 1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
  - 1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
  - 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

#### 3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
- B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed, or until dewatering is no longer required.
- C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
  - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
- D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
  - 1. Maintain piezometric water level a minimum of 24 inches below surface of excavation.
- E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- F. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.
  - 1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.
- G. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

END OF SECTION 02240

## SECTION 02300 - EARTHWORK

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Preparing subgrades.
  - 2. Excavating and backfilling.
  - 3. Subbase course for concrete walks and pavements.
  - 4. Base course for asphalt paving.

#### 1.2 DEFINITIONS

- A. Backfill: Soil materials used to fill an excavation.
- B. Base Course: Layer placed between the subbase course and asphalt paving.
- C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Excavation: Removal of material encountered above subgrade elevations.
  - 1. Additional Excavation: Excavation below subgrade elevations as directed by Architect. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
  - 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- H. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.
- I. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- J. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

#### 1.3 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Contracting Officer and then only after arranging to provide temporary utility services according to requirements indicated.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: ASTM D 2487 Soil Classification Groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
- D. Backfill and Fill: Satisfactory soil materials.
- E. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 5 percent passing a No. 200 sieve and more than 3 percent passing the 0.02 mm sieve.
- F. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 5 percent passing a No. 200 sieve and not more than 3 percent passing the 0.02 mm sieve.
- G. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, freezing temperatures or frost, and other hazards created by earthwork operations. Provide protective insulating materials as necessary.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

- D. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

### 3.2 EXCAVATION

- A. Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
- B. Excavate for structures, pavements, and walks to indicated elevations and dimensions. Extend excavations for placing and removing concrete formwork, for installing services and other construction, and for inspections. Trim bottoms to required lines and grades to leave solid base to receive other work.
- C. Excavate utility trenches to indicated gradients, lines, depths, and invert elevations of uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit.
  - 1. Excavate trenches deeper than bottom of pipe elevation, 6 inches deeper in rock, 4 inches deeper elsewhere, to allow for bedding course. Hand excavate for bell of pipe.
- D. Proof roll subgrades, before filling or placing aggregate courses, with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities.
- F. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Architect.
  - 1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.
- G. Stockpile borrow materials and satisfactory soil materials, without intermixing, in shaped, graded, drained, and covered stockpiles. Stockpile soil materials away from edge of excavations and outside drip line of remaining trees.

### 3.3 BACKFILLS AND FILLS

- A. Utility Trench Backfill: Place, compact, and shape bedding course to provide continuous support for pipes and conduits over rock and other unyielding bearing surfaces and to fill unauthorized excavations.
  - 1. Place and compact initial backfill of satisfactory soil material or subbase material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit. Place and compact final backfill of satisfactory soil material to final subgrade.
  - 2. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

- B. Fill: Place and compact fill material in layers to required elevations.
- C. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
  - 1. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.
- D. Compaction: Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- E. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698 or ASTM D 1557:
  - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 95 percent.
  - 2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 92 percent.
  - 3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 85 percent.
- F. Grading: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated. Grade lawns, walks, and unpaved subgrades to tolerances of plus or minus 1 inch and pavements and areas within building lines to plus or minus 1/2 inch.
- G. Subbase and Base Courses: Under pavements and walks, place subbase course on prepared subgrade. Place base course material over subbase. Compact to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.
- H. Under slabs-on-grade, place drainage course on prepared subgrade. Compact to required cross sections and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

### 3.4 FIELD QUALITY CONTROL

- A. Testing Agency: An independent testing laboratory, approved by the Contracting Officer, shall be retained by the Contractor to perform all testing and observation for earthwork. The Contractor shall pay all costs for such services. All the inspection and testing services shall be performed by, or supervised by, a registered professional engineer specializing in soils and materials testing (Soils Engineer), and all reports and tests shall bear the engineer's professional seal. The Soils Engineer shall be responsible to the Contracting Officer and not to the Contractor.
- B. The Contractor shall closely coordinate all work with the testing laboratory, provide easy access for personnel to all areas to be tested, provide assistance during testing and provide and pay for all samples of materials to be laboratory tested, as requested, in a timely manner.
- C. The Soils Engineer's quality control personnel shall observe, check, and test materials and processes in accordance with ASTM requirements specified by this section, Section 02300 –

Earthwork, and other applicable standards. All such checks and tests shall be performed in a timely manner with the least possible delays and obstructions to normal construction operations.

- D. Allow testing agency to test and inspect subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- E. Observed or tested items that indicate non-compliance with the project specifications and applicable standards shall be documented and immediately brought to the attention of the Contracting Officer together with evaluations as to possible causes of non-conformance.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.
- G. Employment of testing laboratory shall in no way relieve the Contractor of his obligation to perform work in accordance with the Contract Documents.
- H. Frequency of Tests: The frequency of tests shall be sufficient to ensure reasonable coverage of the work being performed. As a minimum, the following test frequency shall be implemented:

Earthwork	Frequency
1. Compaction Testing.	A soils technician on-site 100% of fill construction time, to observe Contractor's procedures and perform density testing.
2. Determine suitability of soil materials.	As Required.
3. Perform laboratory moisture-density relationship curve (proctor), material gradation, plasticity characteristics, and specific gravity.	Each proposed fill material.
4. In-place density and moisture content.	One test per 2,000 square feet of each 8 inch lift, plus as required to verify proper backfilling of structures and confined areas.
5. Subgrade Proof-rolling.	A Soils Engineer to observe proof-rolling of all floor slab and pavement areas, and other areas as shown on the drawings or otherwise specified.
6. Foundations.	A Soils Engineer to be present 100% of the time footing excavations are being performed. Engineer to observe bottom of footing excavations to establish founding level and verify suitability of bearing soils and compare to soil descriptions and characteristics indicated by test borings.
7. Pipe Trenches.	A Soils Engineer is to observe trench excavation and backfill and verify proper bedding and backfilling.

- I. Test Reports: Promptly submit reports of each day's inspections and tests including:

1. Date issued.
2. Project title and project number
3. Testing laboratory name and address.
4. Name and signature of Inspector Engineer.
5. Supervising Engineer's seal.
6. Date of inspection or sampling.
7. Record of temperature and weather.
8. Date of test.
9. Location in project.
10. Type of inspection or test.
11. Observations regarding compliance with Contract Documents.
  - a. Submit reports as per Division 2 Section on Submittal Procedures, except that submittals shall be made directly to the Contracting Officer with copies to the Contractor.

### 3.5 PROTECTION AND DISPOSAL

- A. Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
- D. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 02300

## SECTION 02530 - SANITARY SEWERAGE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes sanitary sewerage outside the building.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.

#### 1.3 SUBMITTALS

- A. Product Data: For the following:
  - 1. Backwater valves and cleanouts.
  - 2. Manhole cover inserts.
- B. Shop Drawings: Include plans, elevations, details, and attachments for the following:
  - 1. Precast concrete manholes, including frames and covers.
  - 2. Cast-in-place concrete manholes and other structures, including frames and covers.
- C. Coordination Profile Drawings: Show system piping in elevation. Draw profiles at horizontal scale of not less than 1 inch equals 50 feet and vertical scale of not less than 1 inch equals 5 feet. Indicate underground structures and pipe. Show types, sizes, materials, and elevations of other utilities crossing system piping.
- D. Field test reports.

#### 1.4 PROJECT CONDITIONS

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
  - 2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

## 2.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Paragraph for applications of pipe and fitting materials.

## 2.3 PIPES AND FITTINGS

- A. Hub-and-Spigot, Cast-Iron Soil Pipe and Fittings: ASTM A 74, gray iron, for gasketed joints.
  - 1. Gaskets: ASTM C 564, rubber, compression type, thickness to match class of pipe.
- B. Ductile-Iron Sewer Pipe: ASTM A 746, for push-on joints.
  - 1. Standard-Pattern, Ductile-Iron Fittings: AWWA C110, ductile or gray iron, for push-on joints.
  - 2. Compact-Pattern, Ductile-Iron Fittings: AWWA C153, for push-on joints.
  - 3. Gaskets: AWWA C111, rubber.
- C. PVC Sewer Pipe and Fittings: According to the following:
  - 1. PVC Sewer Pipe and Fittings, NPS 15 and Smaller: ASTM D 3034, SDR 35, for solvent-cemented or gasketed joints.
    - a. Gaskets: ASTM F 477, elastomeric seals.
  - 2. PVC Sewer Pipe and Fittings, NPS 18 and Larger: ASTM F 679, T-1 wall thickness, bell and spigot for gasketed joints.
    - a. Gaskets: ASTM F 477, elastomeric seals.

## 2.4 MANHOLES

- A. Normal-Traffic Precast Concrete Manholes: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.
  - 1. Diameter: 48 inches minimum, unless otherwise indicated.
  - 2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
  - 3. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
  - 4. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
  - 5. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
  - 6. Gaskets: ASTM C 443, rubber.
  - 7. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch- diameter frame and cover.
  - 8. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
  - 9. Steps: ASTM C 478, individual steps or ladder. Omit steps for manholes less than 60 inches deep.

10. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

B. Manhole Frames and Covers: ASTM A 536, Grade 60-40-18, ductile-iron castings designed for heavy-duty service. Include 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange, and 26-inch- diameter cover. Include indented top design with lettering "SANITARY SEWER" cast into cover.

## 2.5 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

C. Structure Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio. Include channels and benches in manholes.

1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
  - a. Invert Slope: 2 percent through manhole.
2. Benches: Concrete, sloped to drain into channel.
  - a. Slope: 4 percent.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

## 2.6 PROTECTIVE COATINGS

A. Description: One- or two-coat, coal-tar epoxy; 15-mil minimum thickness, unless otherwise indicated; factory or field applied to the following surfaces:

1. Concrete Manholes: On exterior and interior surfaces.
2. Manhole Frames and Covers: On entire surfaces.

## 2.7 BACKWATER VALVES

- A. Gray-Iron Backwater Valves: ASME A112.14.1, gray-iron body and bolted cover, with bronze seat.
  - 1. Available Manufacturers:
    - a. Josam Co.
    - b. McWane, Inc.; Tyler Pipe; Wade Div.
    - c. Smith, Jay R. Mfg. Co.
    - d. Watts Industries, Inc.; Ancon Drain Div.
    - e. Watts Industries, Inc.; Enpoco, Inc. Div.
    - f. Zurn Industries, Inc.; Hydromechanics Div.
  - 2. Horizontal Type: With swing check valve and hub-and-spigot ends.
  - 3. Combination Horizontal and Manual Gate-Valve Type: With swing check valve, integral gate valve, and hub-and-spigot ends.
  - 4. Terminal Type: With bronze seat, swing check valve, and hub inlet.
- B. PVC Backwater Valves: Similar to ASME A112.14.1, horizontal type; with PVC body, PVC removable cover, and PVC swing check valve.
  - 1. Available Manufacturers:
    - a. Canplas, Inc.
    - b. IPS Corp.
    - c. NDS, Inc.
    - d. Plastic Oddities, Inc.
    - e. Sioux Chief Manufacturing Co., Inc.

## 2.8 CLEANOUTS

- A. Gray-Iron Cleanouts: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug. Use units with top-loading classifications according to the following applications:
  - 1. Light Duty: In earth or grass foot-traffic areas.
  - 2. Medium Duty: In paved foot-traffic areas.
  - 3. Heavy Duty: In vehicle-traffic service areas.
  - 4. Extra-Heavy Duty: In roads.
  - 5. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.
- B. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."

- B. Identification: Materials and their installation are specified in Division 2 Section "Earthwork." Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.
  - 1. Use warning tape or detectable warning tape over ferrous piping.
  - 2. Use detectable warning tape over nonferrous piping and over edges of underground structures.
- C. Piping Applications: Include watertight joints.
  - 1. NPS 3: Hub-and-spigot, Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
  - 2. NPS 4 and NPS 6: PVC sewer pipe and fittings, gaskets, and gasketed joints.
  - 3. NPS 8 and NPS 10: PVC sewer pipe and fittings, gaskets, and gasketed joints.
- D. Sleeve-Type Pipe Couplings: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
- E. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.
- F. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.
- G. Use manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.
- H. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- I. Install gravity-flow piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.
  - 1. Install piping pitched down in direction of flow, at minimum slope of 2 percent, unless otherwise indicated.
  - 2. Install piping with 36-inch minimum cover.
- J. Extend sanitary sewerage piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.
- K. Pipe Joint Construction and Installation: Join and install pipe and fittings according to installations indicated.
  - 1. Refer to Division 2 Section "Utility Materials" for basic piping joint construction and installation.
  - 2. Hub-and-Spigot, Cast-Iron Soil Pipe and Fittings: With rubber gaskets according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook." Use gaskets that match class of pipe and fittings.
  - 3. Ductile-Iron Sewer Pipe with Ductile-Iron Fittings: According to AWWA C600.

4. PE Pipe and Fittings: As follows:
  - a. Join pipe, tubing, and gasketed fittings with gaskets for watertight joints according to ASTM D 2321 and manufacturer's written instructions.
  - b. Install according to ASTM D 2321 and manufacturer's written instructions.
  - c. Install corrugated piping according to the Corrugated Polyethylene Pipe Association's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."
5. PVC Sewer Pipe and Fittings: As follows:
  - a. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
  - b. Install according to ASTM D 2321.
6. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.
- L. Manhole Installation: Install complete with appurtenances and accessories indicated.
  1. Form continuous concrete channels and benches between inlets and outlet.
  2. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere, unless otherwise indicated.
  3. Install precast concrete manhole sections with gaskets according to ASTM C 891.
- M. Concrete Placement: Place cast-in-place concrete according to ACI 318 and ACI 350R.
- N. Install backwater valves in piping where indicated.
- O. Install cleanouts and riser extension from sewer pipe to cleanout at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
- P. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding grade.
- Q. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.
- R. Make connections to existing piping and underground structures so finished Work complies as nearly as practical with requirements specified for new Work.
- S. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
- T. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
- U. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.
- V. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.

1. Place plug in end of incomplete piping at end of day and when work stops.
2. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.

### 3.2 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Defects requiring correction include the following:
  - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
  - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
  - c. Crushed, broken, cracked, or otherwise damaged piping.
  - d. Infiltration: Water leakage into piping.
  - e. Exfiltration: Water leakage from or around piping.
2. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
3. Reinspect and repeat procedure until results are satisfactory.

- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate reports for each test.
5. If authorities having jurisdiction do not have published procedures, perform tests as follows:
  - a. Sanitary Sewerage: Perform hydrostatic test.
    - 1) Allowable leakage is maximum of 50 gal. per inch of nominal pipe size per mile of pipe, during 24-hour period.
    - 2) Close openings in system and fill with water.
    - 3) Purge air and refill with water.
    - 4) Disconnect water supply.
    - 5) Test and inspect joints for leaks.
    - 6) Option: Test ductile-iron piping according to AWWA C600, Section "Hydrostatic Testing." Use test pressure of at least 10 psig.
  - b. Sanitary Sewerage: Perform air test according to UNI-B-6.
6. Manholes: Perform hydraulic test according to ASTM C 969.
7. Leaks and loss in test pressure constitute defects that must be repaired.
8. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

END OF SECTION 02530

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## SECTION 02553-NEW SITE NATURAL GAS DISTRIBUTION

### GENERAL

#### 1.1 SUMMARY

- A. System shall be in accordance with State Codes and NFPA Standard No. 54.
- B. Installation and materials shall also be in accordance with American Gas Association recommendations and the local utility regulations.

#### 1.2 SUBMITTAL DATA

- A. See Division 1 Sections for general submittal requirements.
- B. Provide submittal data for any materials or equipment specified in this Section and any special or additional data as requested by the Contracting Officer.

#### 1.3 REFERENCE STANDARDS

- A. The current publications listed below form a part of this specification.
  - 1. American Society for Testing and Materials. (ASTM)
  - 2. D2513 Rev C90 Specification for thermoplastic Gas Pressure Pipe, Tubing & Fittings D3350-84 Polyethylene Plastics pipe and Fittings Materials.
  - 3. American National Standards Institute, Inc. (ANSIO)
  - 4. 2223.1 National Fuel Gas Code-NFPA54, 1999 Edition 831.8-89 Gas Transmission and Distribution Piping Systems
  - 5. American Society of Mechanical Engineers (ASME)
  - 6. 831.8-89 and 831.8A-1990 Gas Transmission Distribution Systems
  - 7. American Gas Association (AGS)
  - 8. ANSI2223.1-1999 National fuel Gas code-NFPA 54, 1999 Edition
  - 9. Title 49 Code of Federal Regulations, Part 192 Plastic Pipe Manual for Gas Service

#### 1.4 SUBMITTALS

- A. The Contractor shall submit manufacturer's literature on piping, valves, valve boxes, fittings, pressure regulators, rollout diaphragm, service risers, warning tape and tracer wire.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 GENERAL DISCRIPTION OF THE WORK

- A. The work to be performed under this Contract consists of furnishing all materials, equipment tools and labor, the performance of all necessary installation and utilities construction complete, including all work appurtenant thereto. The work includes the replacement of existing steel gas

mains and services with new thermoplastic gas pressure pipe. The gas lines to be replaced are four and six inches in diameter. The service branch lines to be replaced are one inch in diameter. The mains to be replaced are located in the On-Base Capehart Housing area. New polyethylene isolation valves and valve boxes will be installed where required. New service lines, risers, regulators and appurtenances will be installed for all housing units serviced by the replacement mains. Work will be accomplished complete including trenching, backfill, surface restoration, and all incidental work.

### 3.2 GENERAL REQUIREMENTS

- A. The general requirements are general in scope and may refer to conditions not encountered on the work covered by this Contract. The design of the new gas Service shall be performed by a licensed engineer that is normally engaged in this area of engineering and the design shall comply with all state and federal codes governing the design and installation of gas service. All areas of work not covered specifically under this statement of work, but are required, are the responsibility of the engineer to determine the required action. All general provisions stated in the basic scope of work for this contract are applicable to this work.

### 3.3 QUALITY OF MATERIALS AND EQUIPMENT

- A. All products used on the effort shall be submitted to the Contracting Officer for approval.

### 3.4 GAS LINE LOCATIONS AND LAYOUT

- A. Contractor shall verify the locations of existing gas mains and services prior to the laying out the location of the replacement mains and services. It is the Government's preference to have gas lines located behind the units wherever possible. New gas mains shall not parallel existing sanitary sewers any closer than 10 feet, nor any other existing utilities any closer than five feet. New gas mains and services shall be located as to avoid existing trees, power poles, fences, patios, and other obstructions as approved. Service entrance to housing units shall be from the back of the unit. Connections in the housing units shall be relocated to a location that can be serviced by the new entry point.

### 3.5 NATURAL GAS OUTAGES

- A. The work shall be performed in such a manner as to ensure that no building, in surrounding housing areas, shall be without service for more than 2 hours. Each new main line section shall be installed, tested, and installed with gas and then its corresponding service line tapped into place. The Contractor shall schedule gas outages 10 days in advance. The Contractor shall be responsible for turning off the pilot lights before gas service is cut off to a building. Houses have pilot light for both the oven and water heater. For units that are not in this contract, but will be effected by this work, the contractor must contact occupants and enter both units to relight them within 15 minutes of resumption of gas service to the building. No building shall be without gas service beyond base working hours (0745-1615).

### 3.6 NATURAL GAS PIPING ABANDONMENT

- A. Existing gas piping to be abandoned in place shall be properly purged and capped. Locations of all gas piping to be abandoned in place shall be accurately shown on project as-built drawings. All caps installed on abandoned mains shall be shown on the plans with two field

dimensions to fixed points. The design of this work shall include the necessary connections to maintain gas service to all other buildings that are not on this line.

### 3.7 PROTECTION AND MAINTENANCE OF PROPERTY

- A. The Contractor shall brace, support, shore, support and maintain all underground pipes, conduits, drains and other underground construction uncovered or otherwise affected by the construction work performed under this scope of work. All trees, driveways, surfacing, pavements, curbs, mailboxes, fences, walks, buildings, utility poles, guy wires, and other surface structures affected by or obstructing construction operations in connection with the performance of the Contract, shall be restored to their original condition as determined by the Contracting Office. All replacements shall be made with new materials.
- B. The Contractor shall be responsible for all damage to the streets, driveways, lawns, trees, landscaping, roads, highways, shoulders, ditches, embankments, culverts, bridges, or other property or facility, regardless of the location or character, which may be caused by moving, hauling, or otherwise transportation of equipment, material, or men to and from the work or any part of the site thereof, whether by him or his subcontractors. The Contractor shall make satisfactory and acceptable arrangements with the Contracting Officer for repair, replacement, or payment of costs incurred in connection with the said damages.

### 3.8 TRAFFIC CONTROL

- A. The Contractor shall schedule his operations in a manner which will assure that:
  - 1. The safety and convenience of the motorists and pedestrians, and the safety of the construction workers are adequately met at all times.
  - 2. The progress of the project is completed in a manner most beneficial to the project as a whole.
  - 3. All signing and stripping shall conform to the standards set forth in the Manual of Uniform Traffic Control Devices (MUTCD), 1978. Signs shall be maintained in a readable condition and shall be removed immediately after the work is completed.
- B. The Contractor shall notify the Contracting Officer of proposed road closures in his Traffic Control Plan. The Contracting Officer's designated representative will then notify emergency services of the road closure. All roads, which are closed to traffic, shall be protected by effective barricades on which shall be placed working warning lights accepted to the Project Inspector. All open trenches and other excavation shall be provided with suitable barriers, signs, and lights to the extent that adequate protection is provided to the public. Obstructions such as material piles and equipment shall be provided with similar warning signs and lights. All barricades and obstructions shall be illuminated by means of working warning lights from sunset to sunrise. The work at times shall be conducted as to cause minimum obstruction and inconvenience to Base traffic and emergency vehicles.

### 3.9 TESTS

- A. The Contractor shall provide all laboratory and field tests required to insure compliance with design, codes, and sound engineering practices by performing:
  - 1. Standard Proctor/Moisture/Density curves for all subgrade and backfill materials encountered and all aggregate base course materials.
  - 2. Field Density Testing for trench backfill and subgrade, minimum of 2 passing tests for the lower backfill lifts, and a minimum of 2 passing tests for the upper backfill lifts at each

- open cut concrete pavement crossing. A minimum of test is required per 500 LF of trench outside roadway crossings.
3. Field Density Testing for Aggregate Base Course, minimum of 1 passing test for each lift of gravel at each asphalt or concrete pavement crossing.
  4. Gradation, abrasion, and fracture tests for aggregate.
  5. All job mix formulas for concrete pavement.
  6. Concrete air, slump tests and cylinder breaks (one set for each day's production).
  7. Gas line pressure tests.
  8. Tracer Wire/Cathodic Protection System testing.

- B. All laboratory and material test submittals shall be approved by the Contracting Officer before placement of any paving materials.
- C. The Contractor will hire an independent testing laboratory for providing nuclear testing for field densities of trench backfill, subgrade gravel and aggregate base course.
- D. Materials, compaction, densities or other construction items, which do not meet the requirements of these specifications, shall be replaced and tested at the Contractor's expense.
- E. The Government Project Inspector shall observe all tests. For tests of long duration, The Government Project Inspector has the option of observing only certain phases of the test.

### 3.10 STREET CROSSING AND TRENCH RESTORATIONS

- A. The Contractor shall make every effort to return streets and other construction areas to regular use as rapidly as possible. Trenches left open over night shall be secured with continuous snow fencing and flashing barricades. The open trenches shall also be bermed when necessary to prevent storm water intrusion. At no time shall the trenching operation be more than 300 feet ahead of pipe laying operations. Following the completion of backfill and compaction operation the ground surface shall be restored. All roadways and driveways shall be kept assessable except during pipe laying and backfill operations.

### 3.11 CONNECTION WITH EXISTING PIPELINES

- A. Where connections are made between existing work and new pipelines, such connection shall be made in a thorough and workmanlike manner and to the satisfaction of the Contracting Officer. Each connection with an existing pipeline shall be made at a time and under conditions which will least interfere with service to area gas users. Under no circumstances shall a gas user be left out of services for over 2 hours.
- B. Existing tracer/cathodic protection wires on connecting mains shall be reconnected to the new mains and wires. Existing anode beds shall also be reconnected to the new tracer wires.

### 3.12 RELOCATING AND REMOVING CONFLICTING ITEMS

- A. The Contractor will be responsible for relocating, removing, avoiding or replacing signs, power poles, guy wires, fences, swing sets, dog houses or any other item in conflict with the construction. All items shall be restored to their original condition or better.

### 3.13 TEMPORARY FENCING

- A. Many of the housing units involved in the project have fences that will require dismantling and resetting during the course of the project. The Contractor shall erect "temporary fencing" for housing units whose occupants require that their fences be re-established overnight. Otherwise, fences shall be reset within 4 hours after the conflicting main or service is installed. The contracting Officer shall approve the use of temporary fencing. Temporary fencing shall be capable of restraining large or small dogs to their designated yards. Fences shall withstand the impact of a jumping 75-pound dog.

#### 3.14 EXPLORATORY EXCAVATION

- A. Exploratory excavation will only be utilized at the discretion of the Contracting Officer's designated representative. In general, exploratory excavation is only intended for use at certain crossings where the actual field location of a utility is uncertain within plus or minus 3 feet on either side of the marked location, and the Contractor will therefore be required to spend an unusually long period uncovering the line. Otherwise, time spent uncovering marked utilities will be considered incidental Work.

#### 3.15 WELDING

- A. Miterring of pipe for changes in direction are not permitted. Branches shall be taken off using welded tees, not by notching or burning hole in main. Weld-O-Lets may be utilized for small connections where approved by the Contracting Officer.
- B. All welds shall be cleaned and given one coat of black, rust-inhibiting paints and protected with PVC tape.
- C. An ASME certified welder holding a current certificate should do welding.

#### 3.16 MATERIALS

- A. POLYETHYLENE PIPE
  - 1. All plastic pipe installed on the project shall be polyethylene pipe conforming to ASTM Specification D2513 and shall meet all tests and requirements of PE 2306 material. All piping shall be SDR II or 11.5.
- B. STEEL PIPE
  - 1. All steel pipe installed on the project shall be X-Tru or equal coated schedule 40 black steel pipe conforming to the minimum requirements of API SPEC 5 L-91 Specifications for steel pipe line. After installation, pipe exposed above The ground shall be painted Dark Brown Fed No. 10118 Fed Color Standard 595A. All steel pipe underground shall have a protective bituminous coating.
- C. FITTINGS
  - 1. Fittings shall be polyethylene for fusion welding and of the same pressure rating and material as the plastic pipes.
- D. VALVES AND VALVE BOXES
  - 1. Maintenance free plastic isolation valves shall be installed. Plastic valves shall be Kerotest, Rockwell, Perfection or equal valves.

2. Valve boxes shall be adjustable height cast iron boxes with lockable cast iron covers marked "GAS". Cover shall be painted bright yellow.

E. GAS REGULATOR STATION VALVES

1. Lockable iron or steel isolation valves shall be installed. The valve shall meet D.O.T./CFR Title 49 Part 192 and SSTM B 16.33. The valves shall have a working pressure of 175-psig minimum. Locking features shall be provided on all valves. Valves shall be Kerotat, Rockwell, Perfection or equal valves.

F. REGULATORS

1. Gas service regulators shall be spring operated with internal relief valves. New regulators shall be Fisher or approved equal. Regulators shall have cast iron casing with Class 125 Flat-faced bodies. Seat ring, metal seat parts and other major metal internal parts shall be brass or stainless steel.
2. Gas regulator station regulators shall be spring operated with internal relief valves. New regulators shall be EQUIMETER or approved equal sized as required. Regulators shall have ductile/iron cast body. Orifice, stems and seat parts shall be brass or stainless steel. Molded soft seats shall be polyurethane.

G. PRESSURE RELIEF VALVE

1. Gas regulator station safety pressure relief valve shall be spring operated with internal relief valves. New safety relief valve shall be EQUIMETER Model 257 S Safety Relief Valve or approved equal and shall be sized as required. The safety relief valve shall have cast iron body. Valve stem and bushing shall be stainless steel.

H. ANODELESS SERVICE RISER

1. Anodeless service risers shall be Uponor Aldyl or approved equal and shall have integral stainless steel tracer wire connectors. Anodeless service risers shall meet applicable DOT requirements and shall be C.S.A. approved and IAMPO listed. Risers shall have threaded or slip-on moisture seals and no loose parts. Risers shall have thin film epoxy coating and individual serializations of each riser.

I. PLASTIC MARKING TAPE

1. Plastic marking tape shall be acid and alkali-resistant polyethylene film, 6 inches wide with a minimum overall thickness of 5.0 mils and shall include a solid aluminum core. Tape color shall be yellow and shall bear a continuous printed inscription describing specific utility.

J. TRACER WIRE/STRUCTURE LEAD

1. Tracer wire shall be Type CP-HMWPE # 14 stranded copper wire.

K. VINYL FENCE

1. The work covered by this section shall consist of furnishing and installing vinyl fence products for the utility enclosure. The vinyl fence material shall be constructed with materials made of rigid Polyvinyl Chloride (PVC) formulated to resist impact and for ultra-violet (UV) stabilization. The extruded products shall meet or exceed ASTM D1784. The manufacturer shall be Buff Tech Inc. or approved equal. Steel reinforcement shall be provided in all members. Gate material shall be steel reinforced. All vinyl materials shall have self extinguishing fire resistant capabilities. The fence material shall be beige in color. The hardware materials used to mount fencing materials to columns, shall be stainless steel. Hinges shall be self-closing and adjustable to relieve sag or misalignment.

3.17 WARNING TAPE

- A. A plastic warning tape shall be installed 18" below ground surface above all new piping except at street and patio crossings. Provide multi-ply tape consisting of solid aluminum foil core between 2 types of plastic.

3.18 TRACER/CATHODIC PROTECTION TESTING

- A. All items installed under this section shall be inspected by the Project Inspector along with a member of the Base cathodic protection shop and/or the Base Plumbing shop before it is concealed and before it is backfilled. The contractor shall Notify the Project Inspector at least 24 hours in advance of any concealment as discussed above. Readings shall be made of the system at every riser and a written report of test results shall be submitted within 3 days after completing the test.

3.19 SODDING

- A. Includes all work necessary for the landscaping and sodding of lawn and landscaped areas disturbed by construction. The work shall consist of ground surface preparation and finish grading, furnishing and placing topsoil, furnishing, applying, and incorporation fertilizer into the soil, resodding, cleanup, and watering. Sodding shall be provided in those areas that are covered with lawn grass, disturbed by the Work, or as directed by the Contracting Officer.

END OF SECTION 02553

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## SECTION 02620 - SUBDRAINAGE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes subdrainage systems for foundations.

#### 1.2 SUBMITTALS

- A. Product Data: For drainage conduit, drainage panels, and geotextile fabrics indicated.

### PART 2 - PRODUCTS

#### 2.1 PIPING MATERIALS

- A. Refer to various application articles in Part 3 for applications of pipe, tube, fitting, and joining materials.

#### 2.2 DRAINAGE PIPES AND FITTINGS

- A. Perforated, PE Pipe and Fittings: ASTM F 405, corrugated, for coupled joints.
  - 1. Couplings: Manufacturer's standard, band type.
- B. Perforated, PVC Sewer Pipe and Fittings: ASTM D 2729, bell-and-spigot ends, for loose joints.

#### 2.3 SPECIAL PIPE COUPLINGS

- A. Description: ASTM C 1173. Rubber or elastomeric sleeve and band assembly fabricated to match outside diameters of pipes to be joined.

#### 2.4 CLEANOUTS

- A. PVC Pipe: ASTM D 3034, PVC cleanout threaded plug and threaded pipe hub.

#### 2.5 DRAINAGE CONDUIT

- A. Pipe and Fittings: Perforated, molded from HDPE complying with ASTM D 1248 into shape of interconnected corrugated pipes, with fittings and geotextile filter fabric jacket.
  - 1. Size: 6 inches high by approximately 1-1/4 inches thick with a flow rate of 15 gpm per foot when tested according to ASTM D 4716.
  - 2. Fittings: HDPE with combination NPS 4 and NPS 6 outlet connection.
  - 3. Couplings: HDPE.

## 2.6 SOIL MATERIALS

- A. Impervious Fill: Clay, gravel, and sand mixture.
- B. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate, Size No. 57, with 100 percent passing 1-1/2-inch sieve and not more than 5 percent passing No. 8 sieve.

## 2.7 GEOTEXTILE FILTER FABRICS

- A. Woven or nonwoven geotextile filter fabric of PP or polyester fibers, or combination of both. Flow rates range from 110 to 330 gpm per sq. ft. when tested according to ASTM D 4491. Available styles are flat and sock.

## PART 3 - EXECUTION

### 3.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."

### 3.2 SUBDRAINAGE SYSTEM APPLICATIONS

- A. NPS 4 Piping:
  - 1. Perforated, PE pipe and fittings, couplings, and coupled joints.
  - 2. Perforated, PVC sewer pipe and fittings for loose, bell-and-spigot joints.
- B. NPS 6 Piping:
  - 1. Perforated, PE pipe and fittings, couplings, and coupled joints.

### 3.3 FOUNDATION DRAINAGE INSTALLATION

- A. Bottom Impervious Fill: Place impervious fill material on subgrade adjacent to bottom of footing after concrete footings have been cured and forms removed. Place and compact impervious fill to dimensions indicated, but not less than 6 inches deep and 12 inches wide.
- B. Drainage Fill: Place supporting layer of drainage fill over compacted subgrade to compacted depth of not less than 4 inches. After installing drainage piping, add drainage fill to width of at least 6 inches on side away from wall and to top of pipe to perform tests. After satisfactory testing, cover piping to width of at least 6 inches on side away from footing and above top of pipe to within 12 inches of finish grade. Place drainage fill in layers not exceeding 3 inches in loose depth; compact each layer placed.
  - 1. Before installing drainage fill, lay flat-style geotextile filter fabric in trench and overlap trench sides. After installing drainage fill, wrap top of drainage fill with flat-style geotextile filter fabric.

- C. Fill to Grade: Place native fill material over compacted drainage fill. Place material in loose-depth layers not exceeding 6 inches. Thoroughly compact each layer. Fill to finish elevations and slope away from building.

### 3.4 PIPING INSTALLATION

- A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.
  - 1. Foundation Subdrainage: Install piping pitched down in direction of flow, at a minimum slope of 0.5 percent and with a minimum cover of 36 inches, unless otherwise indicated.
- B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.
- C. Install PE piping according to ASTM D 2321.
- D. Install PVC piping according to ASTM D 2321.

### 3.5 PIPE JOINT CONSTRUCTION

- A. Join PE pipe, tubing, and fittings with couplings for soiltight joints according to AASHTO's "Standard Specifications for Highway Bridges," Division II, Section 26.4.2.4, "Joint Properties."
- B. Join perforated, PE pipe and fittings with couplings for soiltight joints according to AASHTO's "Standard Specifications for Highway Bridges," Division II, Section 26.4.2.4, "Joint Properties"; or according to ASTM D 2321.
- C. Join PVC pipe and fittings according to ASTM D 3034 with elastomeric seal gaskets according to ASTM D 2321.
- D. Join perforated, PVC pipe and fittings according to ASTM D 2729, with loose, bell-and-spigot joints.
- E. Join perforated, clay pipe and fittings with gaskets according to ASTM C 425.
- F. Special Pipe Couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and that fit both pipe materials and dimensions.

### 3.6 CONNECTIONS

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect low elevations of subdrainage system to solid building storm drainage system.
- C. Where required, connect low elevations of foundation subdrainage to stormwater sump pumps.

3.7 FIELD QUALITY CONTROL

- A. Testing: After installing drainage fill to top of pipe, test drain piping with water to ensure free flow before backfilling. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

3.8 CLEANING

- A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 02620

## SECTION 02630 - STORM DRAINS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. The work covered in this section shall consist of furnishing, placing and constructing storm drains, storm drain manholes, and inlets in accordance with the drawings and specifications.

#### 1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of these specifications to the extent referenced. The publications are referred to in the text by the basic designation only.

1. AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM):

ASTM A-48	Specifications for Gray Iron Castings
ASTM A-746	Specifications for Ductile Iron Gravity Sewer
ASTM C-32	Specifications for Sewer and Manhole Brick
ASTM C-76	Specifications for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
ASTM C-443	Specifications for Joints for Circular Concrete Sewer and Culvert Pipe Using Rubber Gaskets
ASTM C-478	Specifications for Precast Reinforced Concrete Manhole Sections
ASTM C-923	Specifications for Resilient Connectors between Reinforced Concrete Manhole Structures and Pipe
ASTM D-1784	Specification for Rigid Poly Vinyl Chloride (PVC) Compounds and Chlorinated Poly Vinyl Chloride (CPVC) Compounds
ASTM D-2241	Specification for Poly Vinyl Chloride (PVC) Plastic Pipe (SDR-PR)
ASTM D-2321	Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D-3034	Specification for Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings
ASTM D-3212	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM F-667	Specification for Large Diameter Corrugated Polyethylene Tubing and Fittings

ASTM F-810

Specification for Smoothwall Polyethylene (PE) Pipe for Use  
in Drainage and Waste Disposal Systems

PART 2 - MATERIALS

2.1 SUMMARY

- A. Storm drain pipe and appurtenances furnished under this contract shall be as called out in the proposal and/or plans and shall be in accordance with materials and testing as specified. Pipe strength classifications shall be as shown on the plans. All pipe shall be clearly marked with type, class and/or thickness as applicable. Lettering shall be legible and permanent under normal conditions of handling and storage.

2.2 CERTIFICATION BY MANUFACTURER:

- A. The Contractor shall furnish certification by the manufacturer of the pipe to be furnished on this project, certifying that the pipe and fittings comply with the applicable specifications.

2.3 PIPE:

- A. Reinforced Concrete Pipe:
- B. Reinforced concrete pipe shall conform to ASTM C-76. Internal diameter shall be as shown on the drawings. Minimum wall thickness shall be as specified for "Wall B". The pipe shall be furnished in laying lengths of 4 feet or longer. This pipe shall be used for all pipe 24 inches in diameter or greater.
- C. Polyvinyl Chloride Pipe:
  - 1. Polyvinyl chloride pipe shall be made of materials conforming to the requirements of ASTM D-1784, Type 1, Grade 1 for Rigid Polyvinyl Chloride Compounds. The resistance of the pipe to acids and the other reagents shall be established in accordance with ASTM D-543. The loss in weight shall not exceed 0.60% and the change in strength shall not exceed plus or minus 15%. The pipe shall have minimum wall thickness based on SDR35. All PVC pipe and fittings used on this project shall conform to ASTM D-3034. Jointing material for polyvinyl chloride pipe shall be rubber compression rings or solvent weld as recommended by the manufacturer. This product can be used for pipe diameters of 18" or less.
- D. High Density Polyethylene (HDPE) Pipe: HDPE drain pipe shall conform to ASTM F-667. Internal diameter. HDPE pipe shall be Chevron Spirolite Class 63, Hancor Hi-Q, or equivalent approved by the Contracting Officer. This product can be used for pipe diameters less than 24 inches.

2.4 TYPE 1 BEDDING MATERIAL FOR HDPE PIPE:

- A. Type I Bedding Material shall consist of sand, sandy gravel or fine gravel conforming to the following gradation when tested in accordance with AASHTO Method T-88.

U.S. Standard

(Sieve Size)	Percent Passing
12-inch	100

1-inch	95 - 100
2-inch	45 - 80
No. 4	25 - 60
No. 200	0 - 12

- B. That portion passing the No. 40 sieve shall have a maximum plasticity index of 6 when tested in accordance with AASHTO Methods T-89 and T-90.

2.5 TYPE 2 BEDDING MATERIAL:

- A. Type 2 Bedding Material shall consist of suitable granular material conforming to the general requirements of Type 2 Bedding Material as specified in Section 02201.

2.6 RUBBER GASKETS FOR HDPE PIPE:

- A. Rubber gaskets shall conform to ASTM D-3212. The gasket shall be an "O" ring set in a reseated groove on the spigot end of the pipe.

2.7 GASKET LUBRICANT:

- A. Lubricant applied to the elastomeric gasket to facilitate pipe joining shall be consistent with the pipe manufacturer's recommendations and shall have no detrimental effect on the gasket.

2.8 RUBBER JOINTS FOR REINFORCED CONCRETE PIPE:

- A. Rubber joints shall conform to ASTM C-443. The gasket shall be an "O" ring set in a reseated groove on the spigot end of the pipe.

2.9 CONCRETE PIPE FITTINGS:

- A. The manufacturer of the reinforced concrete pipe shall design and construct special concrete pipe tee sections, elbows, temporary plugs and other fittings as required. All special fabrications shall be designed to have the same structural strength and integrity as the pipe on which it is being installed. Temporary plugs shall be gasketed so as to be watertight and easily removable in the future when the storm drain will be extended. Tee sections shall have bell ends for acceptance of rubber gasketed spigot pipe connections.

2.10 INLET GRATES, FRAMES AND CURBS:

- A. Inlet grates, frames and curbs shall be of cast iron conforming to ASTM A-48, Class No. 30 or better.

2.11 MANHOLE RINGS AND COVERS:

- A. Manhole rings and covers shall be of cast iron conforming to ASTM C-48, Class No. 30 or better.

2.12 MANHOLE STEPS:

- A. Manhole steps shall be of Copolymer Polypropylene plastic steps conforming to the construction standard.

2.13 PRECAST CONCRETE MANHOLE RINGS:

- A. Precast concrete manhole sections shall conform to ASTM C-478.

2.14 MANHOLE PIPE SEALS:

- A. The manhole pipe seals shall be a rubber gasket similar to the A-LOK Corporation seal. The gasket shall be manufactured in accordance with ASTM C-443 and designed to meet resilient connector requirements of ASTM C-923. The gasket shall provide 10 degrees of deflection in any direction.

2.15 CONCRETE FOR MANHOLE BASES AND INLET CONSTRUCTION:

- A. Concrete for manhole bases and inlet construction shall have a minimum compressive strength of 3500 psi in accordance with these specifications.

2.16 STORM DRAIN CLEANOUTS

- A. Riser Pipe: Riser pipe for the storm drain riser shall be constructed of the same material that the storm drain it serves is constructed. Fittings and plugs shall be standard items provided or recommended by the pipe manufacturer.
- B. Cleanout Rings and Covers: Cleanout rings and covers shall be cast iron conforming to ASTM A-48, Class 30 or better.

2.17 RIGID INSULATION

- A. Insulation shall be Styrofoam brand insulation, 2 inches thick. Minimum R- value at 25° F. is 11.0 after five years aging.

PART 3 - EXECUTION

3.1 TRENCH EXCAVATION AND BACKFILL FOR STORM DRAINS:

- A. Trench excavation and backfill shall be in conformance with construction specifications for Section 02201, "Trench Excavation and Backfill for Pipelines and Appurtenant Structures" except as specified below for HDPE pipe.
- B. Pipe Bedding Material for HDPE Pipe:
  - 1. Type 1, Pipe Bedding: Type 1 pipe bedding material shall be placed to a minimum depth of six (6) inches under the pipe. The material shall extend to at least six (6) inches above the pipe. Bell holes and depressions for joints shall be dug after the trench bedding has been graded and compacted. The holes shall be only of such length, depth and width as is required for properly making the particular type joint.
  - 2. Type 2, Pipe Bedding: Type 2 bedding material shall be used to replace soft, spongy, or other unsuitable material encountered in trench bottom below the Type 1 pipe bedding material level, to the depth necessary to support the pipe as determined by the Contracting Officer.
  - 3. Bedding Compaction: The pipe bedding material shall be placed in lifts not exceeding six (6) inches in depth and compacted to 95% of maximum dry density as determined by AASHTO T-180.

4. Backfill: The backfill material above the bedding material shall conform to the requirements as specified in Section 02200.

### 3.2 INSTALLATION OF STORM DRAINS:

#### A. General:

1. Pipe shall be installed in accordance with the manufacturer's recommendations and instructions for installing the pipe used. The Contractor shall provide all tools and equipment including any special tools designed for installing of pipe.

#### B. Responsibility for Material:

1. The Contractor shall be responsible for all material furnished by him and shall replace at his own expense all such material found to be defective or damaged. This shall include the furnishing of all materials and labor required for the replacement of installed material discovered to be damaged or defective prior to the final acceptance of the work, or during the guarantee period.
2. The Contractor shall be responsible for the safe and proper storage of material used in the project. The interior of all pipe and other accessories shall be kept free from dirt and foreign matter at all times.

#### C. Handling of Pipe:

1. All pipe shall be delivered and distributed at the site by the Contractor. Pipe, fittings, specials, and accessories shall be loaded and unloaded in a manner to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe shall not be skidded or rolled against pipe already on the ground. Pipe shall be handled in a manner to prevent damage to the coating and lining. Pipe which is damaged shall be rejected.

#### D. Laying Storm Drain and Culverts:

1. Pipe shall be protected in handling to prevent damage. The pipe shall be inspected before lowering into the trench and any concrete pipe sections which are cracked (will not give a clear ringing sound when lightly tapped with a hammer) or which have been chipped or otherwise damaged to such extent that good sound joints, to the full depth of the bell socket cannot be made, will be rejected. Rejected pipe shall be removed from the site immediately. The pipe shall be of the class shown on the drawings. All drain pipe shall be laid true to line and grade.
2. Pipe shall be carefully bedded in Type 1 pipe bedding material. The prepared foundation shall be shaped to conform to the lower quadrant of the pipe. Bell or coupling holes shall be carefully formed so as to not destroy more than nine inches of pipe bearing. The trench bottom shall be over-excavated approximately four inches and brought to grade with bedding materials. Type 1 bedding material shall be installed the full width of the trench to a depth of 4 inches under the pipe and extend up to the centerline of the pipe exterior. Selected backfill shall be utilized from the pipe centerline to a depth 6 inches above the top of the pipe. Trench backfill shall be placed in layers not to exceed 6 inches and each layer shall be wetted and compacted to the density specified in Section 02201. The layers around the pipe shall be tamped on each side of the pipe in a manner that will avoid shifting or displacing the pipe. The remaining layers shall be compacted uniformly across the full width of the backfill.

3. Wherever obstructions not shown on the plans are encountered during the progress of the work and interfere to such an extent that an alteration in the plan is required, the Contracting Officer shall have the authority to change the plans and order a deviation from the line and grade or order the removal, relocation and reconstruction of the obstructions.
4. Proper implements, tools and facilities shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All pipe, fittings and valves shall be carefully lowered into the trench in a manner to prevent damage to pipe. Under no circumstances shall materials be dropped or dumped into the trench.

E. Laying HDPE Pipe:

1. Service load deflections can be offset by orienting the pipe prior to placement in trench. All flexible pipe possess some inherent out-of-roundness. The Contractor shall take advantage of this out-of-roundness to orient the pipe so that the long axis is placed in the trench in the vertical direction. To achieve this, the pipe diameter shall be checked prior to lowering the pipe into the trench. Once the maximum diameter has been determined, these points shall be marked on the inside of the pipe with a lumber crayon. These points shall be at the top and bottom of the pipe when it is placed in the trench. When the pipe is backfilled, the deflection, due to backfilling is offset by the orientation of the pipe. Orienting should be considered for pipe of 30" and larger diameters.

F. Jointing:

1. Reinforced Concrete Pipe: The tongue and groove or bell and spigot shall be clean and dry when the joints are made.
2. Rubber gaskets for circular pipe shall be an "O" ring set in a reseated groove on the spigot end of the pipe. The gaskets shall be of natural or synthetic rubber of a type which will have long life and will not readily deteriorate or lose its resiliency. They shall be of such design as to insure watertight joints.

G. HDPE Pipe:

1. The tongue and groove or bell and spigot shall be clean and dry when the joints are made.
2. Rubber gaskets for circular pipe shall be an "O" ring set in a reseated groove on the spigot end of the pipe. The gaskets shall be of natural or synthetic rubber of a type which will have long life and will not readily deteriorate or lose its resiliency. They shall be of such design as to insure watertight joints.
3. The gasket must be stress-relieved after it is installed on the spigot. This is accomplished by slipping a smooth object, like a screwdriver, under the gasket and running it around the circumference two or three times. After equalizing the stretch in this manner, it is necessary to reposition the gasket so that it is properly seated in the groove. Failing to equalize stretch or reposition the gasket can result in a leaking joint, so care must be taken to see that these steps are carried out.
4. Once the pipe is in the trench, the bell and spigot have been wiped clean, and the gasket is on the spigot, the front of the gasket and the inside surface of the bell must be lubricated. Take care not to allow the lubricated gasket to touch the trench bottom.

H. Polyvinyl Chloride Pipe:

1. Prior to making the pipe joint, all surfaces of the pipe to be jointed, including pre-molded joint materials, shall be wiped clean and dry. Lubricants, primers, adhesives and other materials, including factory-fabricated joint material, shall be used or installed in accordance with the manufacturer's recommendation. Care shall be taken to prevent joint materials from protruding inside the pipe. Any such protruding materials shall be removed before the work will be accepted.
2. Where pipe or unlike materials are to be joined, an approved adapter coupling or collar shall be used as shown on the Construction Standards. The connection to existing pipe shall be made in like fashion. Ductile iron pipe shall be placed in polyethylene encasement.

I. Deflection Control - HDPE Pipe:

1. General: The Contractor shall, for a period of one year after completion and final acceptance of work, warranty and repair excessive vertical deflections of the HDPE storm drain pipe. Vertical deflections are considered excessive when they exceed 7.5% (shortening) of the nominal inside pipe diameter.
2. Deflection Testing: Deflection testing shall be performed by the Contractor one year after final acceptance of work. Acceptable methods of deflection test include:
  - a. Pulling a pre-sized device through the pipe. The device should be sized such that, if the pipe exhibits vertical deflections greater than 7.5 percent, device movement is hindered or blocked. Devices may be either a rigid sphere, nine-arm mandrel, pipeline pig, or other device approved by the Contracting Officer.
  - b. Direct measurement of inside pipe diameters. Measurements shall be obtained at 20-foot spacings along the pipe alignment. When measurements are obtained by workers entering the pipe, all work shall be performed in accordance with OSHA guidelines for work conducted in confined spaces.
  - c. The Contractor shall submit a proposed deflection testing work plan to the Contracting Officer for approval at least 14 days prior to testing.
3. Storm Drain Insulation: Insulation shall be placed over the storm drain one foot above the top of the pipe where called for on the plans or where the earth cover over the pipe is less than 4.0 feet at the Contracting Officer's discretion and direction. In general, insulation is not required on 4 inch storm drain service lines laid on slopes greater than 8 percent with a minimum cover depth of 2.0 feet. Service lines not meeting this condition must be insulated so that the insulation thickness plus soil cover thickness is equivalent to 4 feet of earth. Two inches of insulation shall be considered equal to 12 inches of earth in determining equivalent depth. The trench shall be excavated to a width of 3.5 feet over the sewer. The insulation shall be placed to the thickness required for the full 3.5 foot width, one foot above the sewer.

3.3 INSTALLATION OF MANHOLES:

- A. Manholes shall be constructed of the type and at the locations shown on the drawings and in accordance with the Construction Standards.
- B. Standard Manhole - Type II

1. Manhole Bases: Concrete manhole bases shall be formed as shown on the construction standards and shall be constructed in one monolithic pour or by using a precast bottom 6 inches in thickness with poured flowlines.
2. Walls: Manhole walls shall be precast concrete manhole sections with manhole steps secured into place. The rubber rings or RamNek used for the manhole joints shall be placed as the manhole sections are being placed. Adjusting rings shall be used for adjusting the manhole top elevation to coincide with existing ground elevations, except the total height of adjusting rings used shall not exceed 12 inches. Adjusting rings shall be reinforced with the same percentage of steel as the riser and top and shall be supplied with non-slip lugs to match grooves in the precast manhole top.
3. Tops: The tops of the manholes shall be precast. The tops shall be set 14 inches below the top of the curb on the street or the rim elevation shown on the drawings. The tops shall be sealed to the top of the manhole wall with RamNek.
4. Manholes with Monolithic Sides and Bases - Type II: Manholes less than four feet in height shall be constructed as shown on the Construction Standards No. 02750-02.
  - a. Manhole Bases and Walls: Concrete manhole bases and walls shall be formed as shown on Construction Standards constructed in one monolithic pour. The manhole steps shall be secured into place at the proper location and spacing.
5. Tops: The tops of the manholes shall be precast. The tops shall be set 14 inches below the top of the curb on the street or the rim elevation shown on the drawings. The tops shall be sealed to the top of the manhole wall with RamNek.
  - a. Adjusting rings shall be used for adjusting the manhole top elevation to coincide with existing ground elevations, except the total height of adjusting rings used shall not exceed 12 inches. Adjusting rings shall be reinforced with the same percentage of steel as the riser and top, and shall be supplied with non-slip lugs to match grooves in the precast manhole top.
6. Covers and Rings: Manhole covers and rings shall be cast iron and shall conform to the general dimensional and weight details shown on the Construction Standard. The cast iron ring shall be set on a RamNek seal on top of the adjustment rings.
7. Manhole Steps: Manhole steps shall conform to the dimensions shown on the Construction Standards. They shall have a minimum projection of 4 inches when in place and a minimum overall width of 11 inches and they shall be made of cast iron.
8. Joints: Joints for precast concrete manhole rings shall be preformed rubber gaskets or formed with RamNek, manufactured by K.T. Snyder Company or approved equal, in a manner to produce a watertight joint. Pipes projecting into the manholes shall be grouted into place and cut back to within two inches of the manhole wall with exposed reinforcing removed.
9. Concrete Fillets: Concrete fillets shall be poured in all Type II and Type III manholes to provide slope to the discharge pipe. The fillet height on the walls shall be 12 inches minimum or as shown on the Construction Standards.

#### 3.4 INSTALLATION OF CLEANOUTS:

- A. Cleanouts shall be as noted on the drawings and shall conform to the details shown on the Construction Standards.
- B. 4" cleanouts will be provided on every 4" service line within 5' of every building.
- C. 12" cleanouts shall be provided where shown on the drawings.

3.5 STORM DRAIN INLETS:

- A. Storm drain inlets shall conform to the details shown on the Construction Standards.
  - 1. Base and Wall: The base and wall of the inlet shall be monolithically cast with the walls conforming to ASTM C-76.
  - 2. Inlet Tops: The concrete inlet top shall be precast concrete. The inlet shall be set with the top of the concrete top 12-3/4 inches below the top of curb elevation or the surface of the finish pavement.
- B. Cast Iron Frames, Grates and Curb Openings: Cast iron frames, grates and curb openings shall conform to the general dimensional, weight and details shown on the Construction Standards. Curb inlet grates have angled bar patterns that have optional right or left directional patterns. The Contractor shall select and install the directional pattern that maximizes the grate water intake capability for the specific installation. In general, the grate vanes shall slant in an upstream direction.

3.6 CONNECTIONS TO EXISTING MANHOLES OR STORM DRAINS:

- A. New storm drains shall be connected to existing manholes or storm drains as shown on the drawings. Connections to existing manholes shall be grouted. Connection to existing storm drains shall conform to Construction Standard No. 02750-06.

3.7 SANITARY SEWER CROSSINGS:

- A. Where shown in the storm drain profile concrete support pads having a minimum bearing area of 10 square feet shall be poured on adjacent soil and over the sanitary sewer to protect the plastic sewer pipe.

3.8 PRE-CAST MANHOLE RISER RINGS:

- A. Manhole riser rings shall be pre-cast concrete and shall conform to the general dimensional details shown on the construction standard. Dimensions of manhole shall be field verified.

END OF SECTION 02630

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## SECTION 02740 – HOT-MIX ASPHALTIC PAVEMENT REPLACEMENT

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Existing asphaltic pavement removed shall be replaced with suitable granular courses, bituminous prime coat and asphaltic concrete pavement. All non-gravel surfaces in contact with the new asphalt shall receive a tack coat. Vehicular pavement section shall have a minimum of 12 inches of gravel subbase, 4 inches of crushed gravel base, and 3 inches of asphaltic concrete for asphalt replacement. The running track shall consist of 4 inches of crushed gravel base with 2 inches of asphaltic concrete.

#### 1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of these specifications to the extent referenced. The publications are referred to in the text by the basic designation only.

1. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS:

AASHTO T-84	Specific Gravity and Absorption of Fine Aggregate
AASHTO T-89	Determining Liquid Limit of Soils
AASHTO T-90	Determining the Plastic Limit and Plasticity Index of Soils
AASHTO T-96	Resistance to Abrasion of Small Size Coarse Aggregate by use of the Los Angeles Machine
AASHTO T-104	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
AASHTO T-176	Plastic Fines in Aggregates and Soils by Use of the Sand Equivalent Test
AASHTO T-180	Moisture-Density Relations of Soils using a 10-lb. Rammer and an 18-inc.Drop
AASHTO T-238	Density of Soil and Soil Aggregate In-Place by Nuclear Methods (Shallow Depth)
AASHTO T-239	Moisture Content of Soil and Soil Aggregate In-Place by Nuclear Methods (Shallow Depth)
AASHTO T-245	Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
AASHTO M-20	Penetration Graded Asphalt Cement
AASHTO M-82	Cutback Asphalt (medium curing type)

## Emulsified Asphalt

## Viscosity Graded Asphalt Cement

Req. No. 90-001

## Air Pollution Control and Operating Permits

## Sub.-Chapter 7, Section 17-87801

## Air Pollution Control and Operating Permits

2.1 SUBBASE COURSE:

## 2.2 BASE COURSE:

### 2.3 TACK COAT:

## 2.4 ASPHALTIC CONCRETE MIXTURE:

B. The mixture shall contain asphaltic cement and crushed gravel shall consist of clean, hard, durable stone particles which have been crushed, screened and otherwise processed to meet the following requirements:

	GRADATION	
	% Passing by Weight	
Sieve Size	Min.	Max.
5/8-inch	100	---
1/2-inch	70	90
3/8-inch	40	60
No. 4	30	50
No. 10	15	30
No. 100	7	15

No. 200  
Asphalt Cement

4 10  
6.0% to 7.0% by weight of batch

- C. Of all the particles retained on a No. 4 sieve, at least 70% by weight shall have one or more fractured faces.
- D. The crushed gravel when tested in accordance with AASHTO T-96 (Los Angeles Abrasion Test) shall have a percentage of wear of not more than 30 percent.
- E. The crushed gravel shall show no detrimental amount of stripping when tested as follows:
1. A test sample consisting of the gravel and bitumen to be used in the paving mixture shall be mixed at a temperature of 250°F. The sample shall then be spread in a loose, thin layer and allowed to air-season for 24 hours before testing. A portion of the sample, not over one-half of the capacity of the jar, shall be placed in a one quart jar and completely covered with distilled water. The jar shall be fitted with a tight screw cap and allowed to stand for a period of 24 hours. The jar shall be vigorously shaken for a period of 15 minutes, and the sample of the mixture shall then be examined for stripping.
  2. If stripping occurs, the aggregate shall be rejected or treated by an approved method to change the material from a hydrophobic state.
  3. Admixtures and treating methods shall be supplied at the expense of the Contractor and shall be subject to the special approval of the Contracting Officer. Special attention will be given to the thermal stability of admixtures.
  4. Asphalt cement shall conform to the requirements of AASHTO M-226 for viscosity grade AC5 or pen. 120-150 for penetration graded asphalt per AASHTO M-20. The spot test will be based on naphtha-xylene solvent using 10% xylene. Test results shall be submitted to the Contracting Officer for approval.
  5. Certified test reports for each shipment of asphalt cement shall be furnished in duplicate by the Contractor to the Contracting Officer at the time of delivery of such shipments. A certified weight ticket indicating the net weight of the load shall accompany each shipment of asphalt cement.
  6. The Marshall properties for the mixture shall be as determined by AASHTO T-245, "Resistance to Plastic Flow of Bituminous Mixtures by means of the Marshall Apparatus" shall be:

TEST PROPERTY	MIN.	MAX.
Stability, all mixtures, lb	750	N/A
Flow, all mixtures, 0.01, in.	8	18
Binder Course	4	7
Percent air voids, Surface Course	3	5

- F. The Contractor shall submit an asphalt mix design to the Contracting Officer that complies with these specifications. The mix design, including aggregate and asphalt testing, shall have been performed within 9 months of asphalt placement.

### PART 3 - EXECUTION

#### 3.1 GENERAL:

- A. When pavement is removed during construction, it shall be replaced. When the edge of the remaining pavement is three feet or less from the edge, the replacement may be extended to the edge at the Government's direction.

- B. In-place density shall be determined by AASHTO T-238 and T-239.

3.2 SUBGRADE PREPARATION:

- A. The subgrade for the pavement replacement shall be uniformly graded to the proper depth and the top 6 inches compacted to 95% of maximum dry density obtained at optimum moisture content, as determined by AASHTO T-180. Compaction test results shall be submitted to the Contracting Officer.

3.3 PLACEMENT OF SUBBASE AND BASE COURSES:

- A. The subbase and base course materials shall be placed in maximum six-inch lifts, each lift being wetted to optimum moisture and compacted to a density of at least 95% of the maximum dry density as determined by AASHTO T-180. Compaction test results shall be submitted to the Contracting Officer.

3.4 TACK COAT:

- A. All surfaces that will come in contact with the new asphalt pavement shall receive a tack coat, including all curbs, gutters, headers, manholes, valve boxes, monument boxes, existing concrete and asphaltic pavement, including contact edges, and all other surfaces other than base gravel. The tack coat shall be thin uniform coating. If the first lift of asphalt surfacing is clean and tacky, no tack coat is required. If the first lift is dirty or has been in place more than 2 days, a tack coat shall be applied to the asphalt surface.

3.5 PREPARING AND PLACING ASPHALTIC CONCRETE PAVEMENT:

- A. Each size of hot aggregate, and the asphalt cement shall be measured separately and accurately to the proportions in which they are to be mixed. After the hot aggregate has been charged into the mixer and thoroughly mixed, the asphalt cement shall be added and the mixing of all materials continued for a period of at least 30 seconds, or longer if necessary, to produce a homogenous mixture, in which all particles of the mineral aggregate are coated uniformly.
- B. The asphalt mixture shall be placed in two equal lifts with each lift depth not to exceed 3 inches compacted in place.
- C. The mixture shall have a density when thoroughly compressed of not less than 93% of the calculated density of a voidless mixture composed of the same materials in like proportions. Density of the voidless mixture shall be calculated by the following formula:

$$\text{Density of Voidless Mix} = \frac{100}{\frac{\% \text{ Min. Agg. by Wt.}}{\text{Sp. Gr. Min., Agg}^*} + \frac{\% \text{ Asphalt}}{\text{Sp. Gr. Asphalt}}}$$

Based on apparent specific gravity of the mineral aggregate.

- D. The mixture shall be laid only when the base is dry and only when conditions are suitable. The mixture shall be laid only when atmospheric temperatures are above 40°F. and rising, and when no frost exists in the underlying courses.
- E. The mixture shall be transported from the paving plant to the work in vehicles equipped with tight metal compartments previously cleaned of all foreign material. When directed by the

Contracting Officer, the compartment shall be suitably insulated and each load shall be covered with canvas or other suitable materials of sufficient size to protect it from weather conditions. The inside surface of all vehicle compartments used for hauling mixture must be lightly lubricated with a thin oil just before loading, but excessive lubricant will not be permitted. No loads shall be sent out so late in the day as to interfere with spreading and compacting the mixture during daylight.

- F. The mixture shall be delivered on the work at a temperature of not less than 250°F. The desired temperature shall be set by the Contracting Officer, and shall be maintained at + or - 20°F.
- G. The Contractor shall provide a competent workman who is capable of performing the work incidental to the correction of all pavement irregularities.
- H. The mixture may be spread by mechanical self-powered pavers or by hand placing. When the mixture is spread by means of a paver, it shall be capable of spreading the mixture true to the line, grade and crown required to match existing. The pavers shall be capable of spreading and finishing the material to the required thickness by a strike off and screed action without causing segregation of the mixture. Hand placing and spreading will be permitted in irregular area or when strips less than 8 feet in width are to be paved.
- I. Paver shall be equipped with hoppers and distributing screws of the reversing type to place the mixture evenly throughout the width of the course in front of the adjustable screeds. The mixture shall be dumped in the center of the hoppers, and care exercised to avoid overloading and spilling over of the mixture upon the base. The forward rate of travel of the paver during the progress of the operations of laying the asphaltic concrete shall be capable of being regulated to a speed varying from 10 to 30 feet per minute. The actual speed that will be permitted for any operation will be dependent upon the capacity of the plant to furnish adequately heated and mixed material. The paver crawler tracks or wheels shall be kept clean at all times. The spreading of loose mixture to provide traction for the paver will not be permitted.
- J. When the mixture is to be spread by hand, upon arrival on the work it shall be dumped on the area on which it is to be spread, or shoveled directly from the truck to the area on which it is to be spread. Immediately thereafter it shall be distributed into place by means of hot shovels and spread with hot rakes in a loose layer of uniform density and correct depth.
- K. Tines of the rakes shall not be less than one-half inch longer than the loose depth of the mixture and spaces between tines shall be not less than the maximum diameter of aggregate particle except that in no case should the spaces be less than one inch. Loads shall not be dumped any faster than they can be properly handled by the shovelers nor shall the shoveler distribute the dumped load faster than it can be properly handled by the rakers.
- L. The rakers will not be permitted to stand in the hot mixture while raking it, except where necessary to correct errors in the first raking. The raking must be carefully and skillfully done in such a manner that after the first passage of the roller over the raked mixture, a minimum amount of back patching will be required.
- M. The placing of mixtures shall be as continuous as possible and the roller shall pass over the unprotected edge of the freshly laid mixture only when the laying of this course is to be discontinued for such intervals of time as to permit the mixture to become chilled.
- N. Transverse construction joints shall be made in a careful manner.
- O. Longitudinal joints against both hot and cold material shall be made with equal care. Mixtures spread and compacted, or partially compacted by the paving machine shall not be disturbed by

rakes in dressing the joint, unless one side is too high, nor shall surplus mixture be spread or scattered back of the paving machine when not needed to build up low spots. If one side of the joint is cold, the material shall be moved with the back of the rake to the warm side of the joint, but otherwise the machine-laid mixture shall not be disturbed.

- P. In making the joint along any adjoining edge such as curb, gutter or an adjoining pavement, and after the hot mixture is placed by the finishing machine just enough of the hot material shall be carried back to fill any space left open and to provide a small bead of extra material. This joint shall be properly set up with the back of a rake, at the proper height and bevel to receive the maximum compression under rolling. The work of setting up this joint shall be performed always by competent workmen who are capable of making a correct, clean and neat joint.
- Q. Before placing the mixture against the contact surfaces of curbs, gutters, headers, manholes, etc., the contact surfaces shall be painted with a thin uniform coating of emulsified asphalt (SS-1).
- R. After spreading, the mixture shall be thoroughly and uniformly compressed by a power driven roller. The rollers shall be in good condition and shall be capable of reversing without backlash. The shall be operated by competent and experienced roller men. The rollers shall be kept in continuous operation, as nearly as practicable, and shall be operated so that all parts of the pavement receive substantially equal compression. Rolling equipment shall consist of steel wheel rollers and pneumatic-tired rollers as provided herein.
- S. Steel wheel rollers may consist of either 2-wheel tandem rollers or a steel roller with rubber tired drivers. Steel-wheeled power rollers shall be equipped with a power unit of not less than 4 cylinders. Tandem-type rollers shall weigh not less than 8 tons, and shall weigh not less than 200 pounds per inch width of tread.
- T. Pneumatic-tired rollers shall be self-propelled, of the double-axle type, with a shuttle speed transmission and rear wheel drive, have a width of not less than 4 feet, and shall be equipped with pneumatic tires of equal size and diameter. Treads on pneumatic-tired rollers shall be sufficiently smooth so that they do not leave perceptible tread marks at any time during rolling operations. The tires shall be so spaced as to give complete coverage. The wheels shall not wobble. The roller shall be equipped with mechanical means of distributing the contact pressure uniformly. The air pressure in the several tires shall not vary more than 5 pounds per square inch and shall be not less than 45 pounds per square inch. Pneumatic-tired rollers shall be so constructed that the total weight of the roller can be varied to produce an operating weight per tire of between 1,000 and 2,000 pounds.
- U. The surface course shall conform to the following requirements after final compression.
- V. The surface shall be smooth and true to the established crown and grade to match the existing pavement. The final surface shall be finished with a surface tolerance of one-fourth (1/4) inch, measured as the vertical ordinate from the face of a ten (10) foot straightedge.
- W. The surface course shall have the average thickness specified and no point shall vary more than 1/4 inch from the thickness specified. Any high, low or defective places shall be corrected immediately by cutting out the course at such spots and replacing it with fresh, hot mixture, which shall be compacted immediately to conform with the surrounding area and shall be thoroughly bonded to it.
- X. After final compression, the finished surface course shall at no point have a density less than 93% of the maximum density possible to obtain a void-less pavement composed of the same materials in like proportions. The density shall be determined from specimens cored from the finished pavement by the Contractor at the locations designated by the Contracting Officer. The

asphalt coring, density testing, and patching of core holes shall be the responsibility of the Contractor. Compaction test results shall be submitted to the contracting officer.

- Y. All tapered or feathered edges of the surface course shall be sealed by painting or spraying with an SS-1 emulsified asphalt conforming to AASHTO M-140. The width of the sealing shall be approximately one foot.

END OF SECTION 02740

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## SECTION 02791 – PLAYGROUND SURFACE SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following types of playground surface systems and accessories:
  - 1. Rubber Tile Surfacing or
  - 2. Poured in Place Rubber Surfacing
- B. Related Sections include the following:
  - 1. Division 2 Section 02150 "Clearing and Grubbing" for stripping, grubbing, removing topsoil, and protecting trees to remain.
  - 2. Division 2 Section 02203 "Site Grading and Excavation" for excavation, filling, and grading work, including compacted subgrades and subbase courses, and dewatering.
  - 3. Division 2 Section "Playground Equipment and Structures" for play structures installed only over protective use zones, at appropriate fall heights.
  - 4. Division 3 Section 03300 "Cast-In-Place Concrete" for play structures base for play surfacing.

#### 1.3 DEFINITIONS

- A. Critical Height: Standard measure of shock attenuation. According to CPSC No. 325, this means "the fall height below which a life-threatening head injury would not be expected to occur."
- B. Fall Height: According to ASTM F 1487, this means "the vertical distance between a designated play surface and the protective surfacing beneath it." The fall height of playground equipment should not exceed the Critical Height of the protective surfacing beneath it.
- C. Use Zone: According to ASTM F 1487, this means "the area beneath and immediately adjacent to a play structure that is designated for unrestricted circulation around the equipment and on whose surface it is predicted that a user would land when falling from or exiting the equipment."

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include material descriptions and construction details for each component of playground surface system.
- B. Shop Drawings: For each playground surface system, include materials, cross sections, drainage and installation.
- C. Coordination Drawings: Layout plans and elevations drawn to scale and coordinating installation of playground surface systems with playground equipment. Show playground equipment locations, use zones, fall heights, extent of protective surfacing, and Critical Heights.

- D. Product Samples: For the following:
  - 1. Rubberized Playground surface.
- E. Installer Certificates: Signed by manufacturer certifying that installers comply with requirements.
- F. Product Certificates: Signed by manufacturers of playground surface systems certifying that protective surfacings furnished comply with requirements.
- G. Product Test Reports: From a qualified testing agency indicating playground surface system complies with requirements, based on comprehensive testing of current products.
- H. Material Test Reports: From a qualified testing agency indicating material complies with requirements.
- I. Maintenance Data: For playground surface system to include in maintenance manuals specified in Division 1.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has specialized in installing work similar in material, design, and extent to that indicated for this Project and whose work has resulted in installations with a record of successful in-service performance.
- B. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- C. Standards and Guidelines: Provide playground surface systems complying with applicable provisions of the following, unless more stringent provisions are indicated:
  - 1. CPSC No. 325, "Handbook for Public Playground Safety"; ASTM F 1292; and ASTM F 1487, latest editions.
  - 2. ASTM F 1951-99 for accessibility requirements.
  - 3. ASTM D 2047-82 for playground surface systems coefficient of friction of .9-wet and 1.0 dry.
  - 4. ASTM D 2859 for flammability of finished surface.
  - 5. ASTM D 412-87 for wear course tensile strength of 60 PSI and a minimum % elongation@ break of 140%.

#### 1.6 PROJECT CONDITIONS

- A. Field Measurements: Where playground surface system is indicated to fit to other construction, verify dimensions of other construction by field measurements.

#### 1.7 COORDINATION

- A. Coordinate construction of playground surface systems with installation of playground equipment, including accurate use zones and fall heights, specified in Division 11 Section "Playground Equipment."

### PART 2 - PRODUCTS

## 2.1 PLAYGROUND SURFACE SYSTEMS

- A. General: Provide playground surface system consisting of rubberized material of appropriate thickness that meets appropriate playground safety standards and ADA requirements in tile or poured in place system.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Subgrade shall be in compliance with Section 03300 – Cast-In-Place Concrete.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Stake locations of playground perimeter, playground equipment, use zones, and pathways. Clearly indicate locations of utilities, lawn sprinkler system, subgrade drainage systems, and underground structures.

### 3.3 INSTALLATION, GENERAL

- A. General: Install playground surface system as required to comply with specified requirements for impact-attenuation performance and for accessibility in accordance with manufacturer's recommendations.

### 3.4 INSTALLATION OF PLAYGROUND SURFACE SYSTEM

- A. Allow concrete pad to cure for 28 days prior to installing playground surface system.
- B. Acid etch concrete pad surface and thoroughly dry prior to applying adhesive material.
- C. If tiles are used install playground surface tiles to an even surface with tight joints and flush with the surrounding sidewalk surface as shown on the detail sheet of the plans.
- D. If poured in place playground surface is used, protect surrounding paving during pouring operations.

### 3.5 CLEANING AND PROTECTION

- A. Protect newly installed areas from traffic until playground surfacing has properly adhered to the base material. Keep free of trash and debris. Replace damaged material with matching material.

END OF SECTION 02791

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## SECTION 02821 - CHAIN-LINK FENCES AND GATES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:

1. Galvanized steel chain-link fabric.
2. Galvanized steel framework.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show locations, components, materials, dimensions, sizes, weights, finishes of components, installation and operational clearances, gate swings, and details of post anchorage and attachment and bracing.

### PART 2 - PRODUCTS

#### 2.1 CHAIN-LINK FENCE FABRIC

- A. Steel Chain-Link Fence Fabric: Comply with Chain Link Fence Manufacturers Institute's "Product Manual."
1. Mesh and Wire Size: 2-inch mesh, 0.120-inch diameter].
  2. Zinc-Coated Fabric: ASTM A 392, with zinc coating applied to steel wire mesh fabric after weaving with Class 1, 1.2-oz./sq. ft. minimum coating weight.
- B. Fabric Selvage: Knuckled at both selvages.

#### 2.2 RESIDENTIAL FENCE AND GATE FRAMING

- A. Round Posts and Rail: ASTM F 761.
1. Fence Height: More than 4 feet high and not exceeding 6 feet high.
  2. Line, End, Corner, and Pull Posts and Top Rail: As required for Light-Duty fence.
  3. Gate Posts, Gates, and Accessories: Comply with ASTM F 654, gate type as indicated, made from galvanized steel metal pipe and tubing for individual gate widths 48 inches or less, complete with hardware.
  4. Protective Coating for Steel: Posts, rails, and frames protected with an external coating of not less than 0.6 oz. of zinc/sq. ft., a chromate conversion coating, and a clear, verifiable polymer film; and an internal protective coating of not less than 0.6 oz. of zinc/sq. ft. or 81 percent, not less than 0.3-mil- thick, zinc pigmented coating.

#### 2.3 GATES

- A. Swing Gates: Comply with ASTM F 900 for double gates, made from pipe and tubing complying with ASTM F 1043, complete with hardware.
1. Frames and Bracing: For gate fabric height 6 feet or less .
    - a. Corners: Fittings.

2. Gate Posts: Fabricate members from round galvanized steel pipe for gate fabric heights by leaf widths indicated per ASTM F 900 to suit the Project and coordinated with gate post material.

#### 2.4 TENSION WIRE AND FITTINGS

- A. Metallic-Coated Steel Tension Wire: 0.177-inch- diameter, marcelled tension wire complying with ASTM A 824 at locations indicated.
- B. Fittings: Provide fittings for a complete fence installation, including special fittings for corners. Comply with ASTM F 626.

#### 2.5 CAST-IN-PLACE CONCRETE

- A. General: Comply with ACI 301 for cast-in-place concrete; materials consisting of portland cement complying with ASTM C 150, aggregates complying with ASTM C 33, and potable water.
  1. Concrete Mixes: Normal-weight concrete air entrained with not less than 3000-psi compressive strength (28 days), 3-inch slump, and 1-inch maximum size aggregate.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. General: Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.
- C. Post Setting: Hand-excavate holes for post foundations in firm, undisturbed or compacted soil.
  1. Concrete Footings: Place concrete around posts and vibrate or tamp for consolidation. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured. Set the following post types in concrete footings and protect portion of posts aboveground from concrete splatter:
    - a. Terminal.
    - b. Line; Using mechanical devices to set line posts per ASTM F 567 is not permitted.
    - c. Gate.
    - d. Gate operator-mounting.
- D. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment.
- E. Line Posts: Space line posts uniformly at 10 feet o.c.
- F. Intermediate Rails: Install in one piece at post-height center span, spanning between posts, using fittings, special offset fittings, and accessories.
- G. Bottom Rails: Install, spanning between posts, using fittings and accessories.

- H. Chain-Link Fabric: Apply fabric to outside of enclosing framework.
- I. Tie Wires: Attach wire to chain-link fabric per ASTM F 626. Tie fabric to line posts at maximum interval of 12 inches o.c. and to braces at maximum interval of 24 inches o.c.
- J. Gate Installation: Install gates level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust gate to operate smoothly, easily, and quietly throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

END OF SECTION 02821

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## SECTION 02870 – SITE FURNISHINGS

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Wood fences.
- B. Trash receptacle.
- C. Benches.

#### 1.2 RELATED SECTIONS

- A. Section 02300 – Earthwork.
- B. Section 03300 – Cast-In-Place Concrete.

#### 1.3 SUBMITTALS

- A. Contractor's shop drawings for fabrication and installation as per this Section.
- B. Manufacturer's literature for items specified in this Section.

#### 1.4 QUALITY ASSURANCE

- A. All site furnishings shall be delivered to site in undamaged condition.
- B. Protect all site furnishings from damage due to weather, construction, spills, etc., until final acceptance of work by Contracting Officer.
- C. Requirements for minimum soil compaction and bearing strength and inspection of footing and foundation excavations shall be as specified in Section 02300 – Earthwork.
- D. Provide careful layout and control for all work and verify subgrade and finished surfaces.

#### 1.5 ENVIRONMENTAL CONSIDERATIONS

- A. Existing Site Features and Utilities:
  - 1. Protect trees, shrubs, lawns, and other features remaining as a portion of final landscaping and part of existing adjacent properties off site.
  - 2. Protect bench marks, existing structures, sidewalks, paving and curbs, and other features from damage during construction
  - 3. Protect above and below grade utilities which are to remain.

### PART 2 - PRODUCTS

#### 2.1 WOOD FENCE

- A. Size, shape, type of material, and finishes shall be as indicated on the drawing and/or as specified.
- B. Fence and gate picketts, posts, trim and cap shall be No. 1 fencing (select) Western Red Cedar.
- C. Concrete for post footings shall be 2500 psi concrete at 28 days.
- D. All fasteners shall be hot-dipped galvanized.

## 2.2 TRASH RECEPTACLE

- A. Standard:
  - 1. Model Number: 2814 AT with Domed Top.
  - 2. Color: Bronze.
  - 3. Manufactured by: Columbia Equipment Co., Inc., 180-10 93rd Avenue, Jamaica, NY 11433-1499, (Phone 1-718-658-5900), or approved equal

## 2.3 BENCHES

- A. Standard:
  - 1. Alaska yellow cedar slat 2004-6 bench with PAT type supports.
  - 2. Manufactured by: Columbia Equipment Company, Inc., 180-10 93rd Avenue, Jamaica, NY 11433, (Phone 1-718-658-5900), or approved equal.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Layout and stake locations of site furnishings. Obtain approval of Contracting Officer prior to installation.
- B. Verify that all work affecting the work of this section has been satisfactorily completed prior to installation.
- C. Verify and clearly mark locations of new and existing underground utility lines prior to installation. Notify Contracting Officer if obstructions are encountered.

### 3.2 INSTALLATION

- A. Install site furnishings as per drawings and/or as to manufacturer's recommendations.
- B. Set site furnishings plumb, level, and true to line.
- C. Set site furnishings in place according to manufacturer's recommendations.

END OF SECTION 02870

## SECTION 02871 – PRIVACY FENCING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Privacy Vinyl fencing

#### 1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

#### 1.4 QUALITY ASSURANCE

- A. Extruded rigid polyvinyl chloride (PVC) material to comply with the following:
  - 1. ASTM D792 Specific gravity.
  - 2. ASTM D256 Izod impact
  - 3. ASTM D638 Tensile properties
  - 4. ASTM D648 Deflection temperature
  - 5. ASTM D1784 Cell classification
  - 6. ASTM C94 Ready mixed concrete

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. Outdoor Technologies Inc.
  - 2. Veka Innovations
  - 3. UltraGuard, A division of Alside, Inc.
  - 4. Or equal
- B. MATERIAL
  - 1. Post, rail and picket profiles to be made of an extruded rigid polyvinyl chloride (PVC).
  - 2. Color to be selected from manufacturers' full product range by Contracting Officer.
  - 3. Gates: Powder-coated metal frame with vinyl fence panels attached.
    - a. Fill gate post with concrete and provide min. (2) # 4 re-bars, or as required by manufacturers.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of fence and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Set fence to required levels and lines, with members plumb, true to line, cut, and fitted.
- C. Fit fence to other construction; scribe and cope as required for accurate fit.
- D. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members.
- E. Install at locations as indicated on drawings.

END OF SECTION 02871

## SECTION 02872 – MISCELLANEOUS ITEMS OF SITE CONSTRUCTION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Miscellaneous items of construction shall consist of those items not specifically covered in other sections of these specifications.

### PART 2 - MATERIALS

#### 2.1 CONCRETE CURB AND GUTTER:

- A. Existing concrete curbs and concrete curb and gutter shall be removed where necessary for construction of the storm drain piping, and inlets. Existing curb and gutter shall be removed to the nearest control joint if it is within 10 feet of the crossing point. If the control joint is further, the curb shall be saw cut at least 3 inches deep, the curb broken and removed. New curb shall be reinstalled to replace the curb removed. The curb shall be placed on a minimum of 6 inches of crushed gravel material specified in Section 02203. The crushed gravel base shall extend a minimum of 12 inches behind the back of the curb. Concrete for curb sections shall have a minimum compressive strength of 4000 psi in accordance with Sections 03300. The curb section shall match the existing curb section removed and have the same reinforcing steel pattern.

#### 2.2 MANHOLE LIDS AND VALVE BOX:

- A. Manholes lids and valve boxes located in the construction limits shall be adjusted to finished grade.
- B. Manholes shall be adjusted with adjusting rings, except the total height of adjusting rings shall not exceed 18 inches, including existing rings. Where manhole requires more adjustment than can be done with adjusting rings, existing adjusting rings and cone shall be removed, 48-inch riser installed, and the adjusting rings replaced to match finished grade elevations.
- C. The area surrounding utility boxes that were constructed on concrete slabs shall be graded flush with concrete slab.
- D. Valve box cover extensions shall be wrapped with polyethylene and adjusted to finished grade.

#### 2.3 UTILITY CROSSINGS:

- A. Existing utilities such as electrical and communications duct banks, water lines, and other utilities that pass over or alongside the new storm drain lines shall not be disturbed and shall remain in place and in use while the new storm drain line is being constructed. The Contractor is responsible for locating all existing utilities. Telephone One-Call 48 hours prior to digging to have off-base owned utilities located.
- B. Use all possible means to locate all utilities including exploratory excavations, line tracers, and locates from all possible utility owners. The storm drain line shall be tunneled beneath these utilities as necessary. Provide adequate support of all existing utilities to prevent their movement or collapse during construction of the storm drain. Any utilities damaged by the

Contractor during construction shall be repaired to the satisfaction of the Government at no additional cost to the Government.

2.4 EXPLORATORY EXCAVATION:

- A. The location of existing pipe lines and services not adjacent to manholes or the location of buried utilities that might interfere with alignment or grade, shall be verified by exploratory excavation prior to construction when agreed to by the Contractor and Contracting Officer. If any existing utility interferes with the work in either alignment or grade and has to be moved, such work shall be done by the Contractor.

2.5 SIGNS:

- A. Existing signs that must be removed where necessary for the construction of the storm drain piping or to fill ditches shall be replaced in the same condition prior to construction.

2.6 JOGGING PATH

- A. The jogging path shall be constructed with 2" of asphalt over a 4" cushion gravel base. Gravel base shall meet requirements of Section 02740 – 3.02 Crushed Gravel Base Course. Asphalt concrete mixture and construction of jogging path shall be done in accord with Section 02740.

2.7 ROOF DRAIN DISCHARGES

- A. Water from roof drains is to be conveyed a minimum of 4' from the outside edge of the building.

END OF SECTION 02872

## SECTION 02930 – LAWNS AND GRASSES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. All turf areas within project boundaries shall be sodded, hydroseeded or reconditioned.
- B. This Section includes the following:
  - 1. Fine grading and preparing lawn areas.
  - 2. Furnishing and applying new topsoil.
  - 3. Furnishing and applying soil amendments.
  - 4. Furnishing and applying fertilizers.
  - 5. Hydroseeding new lawns.
  - 6. Sodding new lawns.
  - 7. Reconditioning existing lawn areas.
  - 8. Replanting unsatisfactory or damaged lawns.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 2 Section 02150 "Clearing and Grubbing" for protection of existing trees and planting, site clearing.
  - 2. Division 2 Section 02202 "Site Grading and Excavation" for excavation, filling, rough grading, and subsurface aggregate drainage backfill.

#### 1.3 SUBMITTAL

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for the following:
  - 1. Fertilizers:
- C. Certification of grass seed from seed vendor for each grass-seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
  - 1. Certification of each seed mixture for sod, identifying sod source, including name and telephone number of supplier.
- D. Certification by product manufacturer that the following products supplied comply with requirements:
  - 1. Fertilizers:
- E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of architects and owners, and other information specified.

- F. Material test reports from qualified independent testing agency indicating and interpreting test results relative to compliance of the following materials with requirements indicated
  - 1. Analysis of imported topsoil.
- G. Planting schedule indicating anticipated dates and locations for each type of planting.
- H. Maintenance instructions recommending procedures to be established by Government for maintenance of landscaping during an entire year. Submit before expiration of required maintenance periods.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful grass establishment.
  - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that grass planting is in progress.
- B. Topsoil Analysis: Furnish a soil analysis made by a qualified independent soil-testing agency stating percentages of organic matter, inorganic matter (silt, clay, and sand), deleterious material, pH, and mineral and plant-nutrient content of topsoil.
  - 1. Report suitability of topsoil for lawn growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce a satisfactory topsoil.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.
- B. Sod: Harvest, deliver, store, and handle sod according to the requirements of the American Sod Producers Association's (ASPA) "Specifications for Turfgrass Sod Materials and Transplanting/Installing."

#### 1.6 COORDINATION AND SCHEDULING

- A. Planting Season: Sow lawn seed and install sod during normal planting seasons for type of lawn work required. Correlate planting with specified maintenance periods to provide required maintenance from date of Substantial Completion.
- B. Weather Limitations: Proceed with planting only when existing and forecast weather conditions are suitable for work.

#### 1.7 MAINTENANCE

- A. Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
  - 1. Seeded Lawns: 60 days after date of Substantial Completion.
    - a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established at that time, continue maintenance during next planting season.
  - 2. Sodded Lawns: 30 days after date of Substantial Completion.

- B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.
  - 1. Replant bare areas with same materials specified for lawns.
  - 2. Add new mulch in areas where mulch has been disturbed by wind or maintenance operations sufficiently to nullify its purpose. Anchor as required to prevent displacement.
- C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawns uniformly moist to a depth of 4 inches.
  - 1. Lay out temporary lawn-watering system and arrange watering schedule to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly seeded areas.
  - 2. Water lawn at the minimum rate of 1 inch per week.
- D. Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height without cutting more than 40 percent of the grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain following grass height:
  - 1. Mow grass 3 inches high.
- E. Postfertilization: Apply fertilizer to lawn after first mowing and when grass is dry.
  - 1. Use a slow release fertilizer that will provide actual nitrogen at 1 lb per 1000 sq. ft. of lawn area.

## PART 2 - PRODUCTS

### 2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.
  - 1. Seed Mixture: Provide - Kentucky bluegrass [mixture of 3 adapted varieties] 75%. Other seed types, adapted fine fescues and perennial ryegrass' 25%.

### 2.2 SOD

- A. Sod: Certified turfgrass sod complying with ASPA specifications for machine-cut thickness, size, strength, moisture content, and mowed height, and free of weeds and undesirable native grasses. Provide viable sod of uniform density, color, and texture consisting primarily of locally adapted Kentucky bluegrass varieties, strongly rooted, and capable of vigorous growth and development when planted.

### 2.3 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch or larger in any dimension, and other extraneous materials harmful to plant growth.

- B. Topsoil Source: Import topsoil from off-site sources. Obtain topsoil from naturally well-drained sites where topsoil occurs at least 4 inches deep; do not obtain from bogs or marshes.

## 2.4 SOIL AMENDMENTS

- A. Provide soil amendments based on recommendations from the soils test including, but not limited to the following:
- B. Sand: Clean, washed, natural or manufactured sand, free of toxic materials.
- C. Perlite: Horticultural perlite, soil amendment grade.
- D. Peat Humus: Finely divided or granular texture, with a pH range of 6 to 7.5, composed of partially decomposed moss peat (other than sphagnum), peat humus, or reed-sedge peat.
- E. Sawdust or Ground-Bark Humus: Decomposed, nitrogen-treated, of uniform texture, free of chips, stones, sticks, soil, or toxic materials.
  - 1. When site treated, mix with at least 0.15 lb. of ammonium nitrate or 0.25 lb of ammonium sulfate per cu. ft. of loose sawdust or ground bark.
- F. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.
- G. Herbicides: EPA registered and approved, of type recommended by manufacturer.
- H. Water: Potable.

## 2.5 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:
- B. When used as a soil amendment, revise fertilizer mix to remedy deficiencies found in soil tests.
- C. Composition: commercial grade fertilizer with a ratio of 1:4:1 of nitrogen, phosphorus and potassium. Provide 1 pound actual nitrogen per 1000 square feet of soil surface.
- D. Postfertilization - Slow-Release Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

## 2.6 2.06 MULCHES

- A. Peat Mulch: Provide peat moss in natural, shredded, or granulated form, of fine texture, with a pH range of 4 to 6 and a water-absorbing capacity of 1100 to 2000 percent.
- B. Fiber Mulch: Biodegradable dyed-wood cellulose-fiber mulch, nontoxic, free of plant growth- or germination-inhibitors, with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

- C. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application, nontoxic and free of plant growth- or germination-inhibitors.

## 2.7 EROSION-CONTROL MATERIALS

- A. Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
- B. Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, 0.92 lb per sq. yd. minimum, with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
  - 1. Protect adjacent and adjoining areas from hydroseed overspraying.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

### 3.3 PLANTING SOIL PREPARATION

- A. Limit subgrade preparation to areas that will be planted in the immediate future. Excavated areas or areas where trees and shrubs have been removed will have soil compacted to reduce slump.
- B. Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter.
  - 1. Areas within a 20 foot diameter of the playground perimeters shall have the following special soil treatment prior to sod laying:
    - a. This area is to then be prepared as following and sodded immediately.
    - b. Two inches well rotted manure shall be spread upon the soil surface then immediately tilled into the top 6 inches of soil.
    - c. Manure is to be transported into the area only at time of spreading and tilling and is not to be stockpiled on Government property.
    - d. This area is not to be left unattended at any time before sodding and no unauthorized persons are to be allowed in the area.
    - e. Any leftover or scattered manure is to be cleaned up and removed before the end of the days work.

- C. Mix soil amendments and commercial fertilizer with topsoil at rates indicated. Delay mixing fertilizer if planting does not follow placing of planting soil within a few days. Either mix soil before spreading or apply soil amendments on surface of spread topsoil and mix thoroughly into top 4 inches of topsoil before planting.
- D. Spread topsoil to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen.
  - 1. Place approximately 1/2 the thickness of topsoil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
  - 2. Allow for sod thickness in areas to be sodded.
- E. Preparation of Unchanged Grades: Where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:
  - 1. Remove and dispose of existing grass, vegetation, and turf. Do not turn over into soil being prepared for lawns.
  - 2. Till surface soil to a depth of at least 6 inches. Apply required commercial fertilizers and mix thoroughly into top 4 inches of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
  - 3. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
  - 4. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Government's property.
- F. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1-1/2 inches in any dimension, and other objects that may interfere with planting or maintenance operations.
- G. Moisten prepared lawn areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- H. Restore prepared areas if eroded or otherwise disturbed after fine grading and before planting.

### 3.4 HYDROSEEDING NEW LAWNS

- A. Hydraulic Seeding: A hydraulic method of planting seed and distributing fertilizer will be utilized for seeding Kentucky Bluegrass seed mixture as hereinafter specified. Seed, mulch and fertilizer shall be provided by the Contractor. Equipment: Hydraulic equipment used for the application of fertilizer and seed shall be of the "Super-Hydroseeder" type, manufactured by the Finn Equipment Company, Cincinnati, Ohio, or other approved types. This equipment shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix a slurry containing fertilizer and seed solids in the quantity specified per acre. The slurry distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with a set of hydraulic spray nozzles which will provide even distribution of the slurry on the various slopes to be seeded. The slurry tank shall have a minimum capacity of 1,000 gallons and shall be mounted on a traveling unit which may be either self-propelled or drawn with a separate unit which will place the slurry tank and spray nozzles within sufficient proximity to the areas to be seeded so as to provide uniform distribution without waste. The Contracting Officer may authorize equipment with smaller tank capacity provided that the equipment has the necessary agitation system and sufficient pump capacity to spray the slurry in a uniform coat. Application: The application of the seed-fertilizer slurry shall be made with equipment specified above and shall be accomplished immediately upon completion of the final

tillage. The slurry shall be applied at the rate of 1,800 gallons of water, fertilizer, and seed per acre, and shall be sprayed over the soil in a uniform coat. Upon completion of the project, a final check of the total quantities of seed and fertilizer used will be made against the total area treated, and if the minimum rates of application have not been met, the Contracting Officer shall require the distribution of additional quantities to make up the minimum rates of application specified. The mulch shall be applied at the rate of 1,500 pounds per acre at the same time the seed and fertilizer is applied.

### 3.5 SODDING NEW LAWNS

- A. Lay sod within 24 hours of stripping. Do not lay sod if dormant or if ground is frozen.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface.
  - 1. Sod is not to be dumped or dropped from truck or pallet.
  - 2. Lay sod across angle of slopes exceeding 1:3.
  - 3. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.
- C. Saturate sod with fine water spray immediately upon planting. During first week, water daily or more frequently as necessary to prevent wilting and to maintain moist soil to a minimum depth of 1-1/2 inches below the sod.

### 3.6 RECONDITIONING LAWNS

- A. Recondition existing lawn areas damaged by Contractor's operations, including storage of materials or equipment and movement of vehicles. Also recondition lawn areas where settlement or washouts occur or where minor regrading is required.
- B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.
- C. Where substantial lawn remains, mow, dethatch, core aerate, and rake. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- D. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of it off the Government's property.
- E. Till stripped, bare, and compacted areas thoroughly to a depth of 6 inches.
- F. Apply required commercial fertilizers and mix thoroughly into top 4 inches of soil. Provide new topsoil as required to fill low spots and meet new finish grades.
- G. Apply sod as required for new lawns.
- H. Water newly planted areas and keep moist until new grass is established.

3.7 SATISFACTORY LAWN

- A. Seeded lawns will be satisfactory provided requirements, including maintenance, have been met and a healthy, uniform, close stand of grass is established, free of weeds, bare spots exceeding 5 by 5 inches, and surface irregularities.
- B. Sodded lawns will be satisfactory provided requirements, including maintenance, have been met and healthy, well-rooted, even-colored, viable lawn is established, free of weeds, open joints, bare areas, and surface irregularities.
- C. Replant lawns that do not meet requirements and continue maintenance until lawns are satisfactory.
- D. If at any time before completion and acceptance of the entire work covered by this contract, any portion of the surface becomes gullied or otherwise damaged following seeding the affected portion shall be repaired to re-establish the condition and grade of the soil prior to seeding and shall then be reseeded as specified above.

3.8 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto surface of roads, walks, or other paved areas.
- B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period until lawn is established.

END OF SECTION 02930

## SECTION 02950- IRRIGATION SPRINKLER SYSTEM

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. The work described in this section includes the materials and equipment for the installation of the automatic sprinkler system. The sprinkler system shall be designed for air purging all pipe lines less than 4 inches in diameter for winter shutdown. Smaller size distribution pipes are described in this section.

#### 1.2 SYSTEM DESIGN

- A. An irrigation system design is provided as part of the contract document. Placement of heads shall be determined by the Contractor to achieve full even coverage including coverage around all existing obstacles and without overspray. Additional piping and sprinkler heads of the appropriate size and type shall be provided by the contractor as necessary to meet these requirements. The size of nozzles, flow rate, and trajectory shall be determined by the Contractor to achieve full and even coverage. Pressures in the water main providing water to the sprinkler piping may vary from 40 to 80 psi depending on flow and location. The location of all heads and piping must be approved by the Contracting Officer prior to installation.

#### 1.3 WARRANTIES

- A. Manufacturer's Material Warranty: All sprinkler heads shall have a full five year warranty from the date of original installation. All electric remote control valves shall have a full three year warranty from date of original installation. The manufacturer shall replace free of charge, parts found to be defective under normal use and service within the warranty period.
- B. Installation Warranty: The Contractor shall warranty all materials and the installation for a period of 12 months from the date of final acceptance by the Government. The Contractor shall replace at no charge to the Government all defective materials and correct all installation defects.

#### 1.4 ACCEPTABLE MANUFACTURERS

- A. The Contractor shall base his bid utilizing sprinkler heads, zone control valve boxes, and valves manufactured as listed below. All products of manufacturer shall have all optional features and be the model specified.

#### 1.5 SUBMITTALS

- A. Product Data Submittals: A minimum of five (5) copies of manufacturer's descriptive literature for all materials utilized in the work shall be submitted to the Contracting Officer for review and approval.
- B. Operation and Maintenance Manual: A minimum of three (3) copies of complete operating and maintenance information shall be provided for valves, and sprinkler heads. This information shall include all operating and maintenance procedures recommended by the manufacturer

including complete parts list, assembly drawings, and wiring diagrams. Information shall also contain spring startup procedures, winterization instructions, and warranty information. All copies shall be clear and legible.

1.6 OPERATOR TRAINING

- A. After the system installation is complete and the system is operable, the Contractor shall provide a minimum of 4 hours of training for the Government's operating personnel. Training shall include detailed instructions on spring start up and fall winterization features, valve and sprinkler head maintenance and repair, and irrigation controller programming and options.

1.7 AS-BUILT DRAWINGS

- A. During construction of the system the Contractor shall develop and maintain as-constructed drawings showing exact locations of piping, valves, and control cable with dimensions referencing locations to physical features observable from ground surface.

1.8 START-UP AND WINTERIZATION SERVICES

- A. The Contractor shall include as part of his work the first winterization of the system in the fall after the installation is complete and the first start-up of the system the following spring. Start-up shall be completed between April 25th and May 5th.

1.9 SYSTEM PERFORMANCE REQUIREMENTS

- A. Minimum Water Coverage: 100 percent of turf and planting areas shown on drawings. All irrigated areas within this project shall have "head to head" coverage.
- B. Minimum Water Pressure: Water pressure and flow shall be adequate to operate all components of the irrigation system so as to meet the design standards.
- C. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties, unless otherwise indicated:
  - 1. Pressure Piping: 200 psig
  - 2. Circuit Piping: 150 psig

1.10 QUALITY ASSURANCE

- A. Product Options: Other manufacturer's products with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- C. Comply with requirements of utility supplying water and authorities having jurisdiction for preventing backflow and back siphonage.
- D. Comply with ASTM F 645, "Guide for Selection, Design, and Installation of Thermoplastic Water Pressure Piping Systems."

- E. Comply with NFPA 70, "National Electrical Code," for electrical connections between wiring and electrically operated devices.
- F. AASHTO T-89, Determining the Liquid Limit of Soils.
- G. AASHTO T-90, Determining the Plastic Limit and Plasticity Index of Soils.
- H. WW-V-54d, Valve, Gate, Bronze (125, 150, and 200 and Int. AM-1 Pound, Threaded Ends, Flanged Ends, Solder End and Brazed Ends, for Land Use).
- I. American Water Works Association (AWWA) Standards.

#### 1.11 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of these specifications to the extent referenced. The publications are referred to in the test by the basic designation only.

##### AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO T-89	Determining the Liquid Limit of Soils
AASHTO T-90	Determining the Plastic Limit and Plasticity Index of Soils

##### AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM)

ASTM D-1784	Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D-2241	Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR)
ASTM D-2467	Specification for Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Plastic, Automatic Control Valves:
    - a. Rain Bird Sprinkler Mfg. Corp.
  - 2. Rain Bird Model PEB Series
  - 3. Quick Couplers:
    - a. Rain Bird Sprinkler Mfg. Corp.
  - 4. Sprinklers:
    - a. Large area – gear drive- Rainbird Falcon, full and part circle, or approved equal.
    - b. Small area – Pop-up spray – Rainbird 1804, or approved equal.
  - 5. Hunter Industries.
  - 6. Rain Bird Sprinkler Mfg. Corp.
  - 7. Toro Co. Irrigation Div.
  - 8. Controllers:
    - a. Rain Bird Sprinkler Mfg. Corp.
  - 9. ESP-SAT

## 2.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" and "Valve Applications" articles for application of pipe and tube materials, joining methods, and valve applications.

## 2.3 PIPES AND TUBES

- A. PVC Pipe: ASTM D 1785, PVC 1120 compound, Schedules 40 and 80.

## 2.4 PIPE AND TUBE FITTINGS

- A. PVC Socket Fittings, Schedule 80: ASTM D 2467.
- B. PVC Threaded Fittings: ASTM D 2464.
- C. Transition Fittings: Manufactured assembly or fitting, with pressure rating at least equal to that of system and with ends compatible to piping where fitting is to be installed.

## 2.5 VALVES AND VALVE SPECIALTIES

- A. Plastic Diaphragm Valves: Molded-plastic body, normally closed, with manual flow adjustment, and operated by 24-V, ac solenoid.
- B. Quick-Couplers: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, ¾-11.5NH threads for garden hose on outlet; and operating key.
  - 1. Locking Top Option: Include vandal-resistant, locking feature with two matching keys.
- C. Control-Valve Boxes: 10 inch round minimum size. Valve boxes shall be plastic. The boxes shall be such length as will be adapted, without full extension, to the depth of cover required over the pipe at valve location. Plastic boxes shall be a standard catalog product of a manufacturer regularly engaged in the manufacture of valve boxes. Plastic boxes installed in turfed areas shall have green covers. Boxes housing control valves shall have lockable covers. Plastic shall be rigid combination of polyolefin and fibrous inorganic.

## 2.6 SPRINKLERS

- A. Description: Manufacturer's standard sprinklers designed for uniform coverage over entire spray area indicated, at available water pressure.
- B. Pop-up, Spray Sprinklers: Fixed pattern, with screw-type flow adjustment and stainless-steel retraction spring.
- C. Pop-up, Rotary, Spray Sprinklers: Gear drive, full-circle and adjustable part-circle types.

## 2.7 AUTOMATIC CONTROL SYSTEM

- A. Wiring: UL 493, Type UF, solid copper-conductor, insulated cable, suitable for direct burial.

1. Low-Voltage, Branch-Circuit Cables: No. 14 AWG minimum, between controllers and automatic control valves and color-coded different than feeder-circuit-cable jacket color and with jackets of different colors for multiple-cable installation in same trench.
2. Splicing Materials: Pressure-sensitive, thermoplastic tape; waterproof sealing packets; or other waterproof connectors.

## 2.8 IDENTIFICATION

- A. Refer to Division 2 Section 02201 for plastic underground warning-tape materials.
  1. Solid blue film with continuously printed black-letter caption, "CAUTION – WATER LINE BURIED BELOW."
  2. Solid blue film with metallic core and continuously printed black-letter caption, "CAUTION – WATER LINE BURIED BELOW."

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. The Contractor shall be responsible for staking out the system and adjusting the heads and lines to provide coverage. Contractor shall furnish and install additional heads and piping if sufficient coverage is not provided.
- B. Piping smaller than 4 inches in diameter may be pulled in place. Piping pulled in place shall have a minimum cover depth of 12 inches in the vicinity of valve locations and a minimum depth of 6 inches at other locations on lateral sprinkler lines. All piping that may cut the root zones of trees shall be bored into place without excavation.
- C. In areas where trenching is required for irrigation laterals, each section of pipe in trenches shall rest on pipe bedding for the full length of its barrel, with recesses excavated to accommodate joints. PVC piping shall be surrounded and covered on all sides with 6 inches of the same bedding material as described here. The bedding shall consist of sand or other suitable granular material having a uniform gradation and a maximum plasticity of 6, as determined by AASHTO Methods T-89 and T-90.
- D. When the bottom uncovered at subgrade is soft and cannot support the pipe, a further depth and/or width shall be excavated and refilled to grade with gravel or other suitable material.
- E. Rotary stream pop-up sprinkler heads shall be set with the heads plumb and shall be carefully backfilled with backfill compacted to prevent movement. The heads shall be set approximately 1 inch above the ground surface. The heads shall be connected to the sprinkler pipe with a swing riser assembly. A male to male bushing shall be used to connect the head to the riser. All valves shall be set plumb in valve boxes. Box covers shall be secured in place by bolts.

### 3.2 VALVE CONTROL CABLE

- A. All control cable exposed above ground shall be placed in conduit. All underground splices shall be fully encapsulated and waterproof. Underground cable can be laid in the same trench with the pipe provided the cable is laid to the side. If multiple cables are installed in a trench, the cables shall be bundled together with straps at least once every 20 feet. A minimum of 6 inches of extra wire shall be provided at each valve. Provide 6 inch diameter loops in the underground

cable at 100 feet intervals and at all direction changes. Cable shall have a minimum of 6 inches of cover.

- B. All conductors shall be checked for continuity and electrical leakage after the cable is installed and backfilled. The cable system shall be free of electrical faults and discontinuities and shall be removed and replaced if any exist. Evidence of test results shall be provided to the Government prior to final acceptance.

### 3.3 FLUSHING OF SPRINKLER SYSTEMS

- A. The entire sprinkler system shall be thoroughly flushed and cleaned prior to installing nozzles and screens in sprinkler heads. Extreme care shall be taken to protect valves and sprinkler heads from plugging or damage during flushing operations.

### 3.4 TESTING

- A. Pipe Testing: Testing of sprinkler piping shall not be pressure tested, but any visible leaks that appear after start up shall be repaired.
- B. Performance Testing: The entire irrigation system shall be started and checked for proper performance by the Contractor. After all deficiencies have been corrected, system performance shall be demonstrated and meet the satisfaction of the Contracting Officer.

END OF SECTION 02950

## SECTION 02955 – TREES AND SHRUBS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Trees.
  - 2. Shrubs.
  - 3. Topsoil and soil amendments.
  - 4. Fertilizers and mulches.
  - 5. Stakes and guys.
  - 6. Landscape edgings and weed control barriers.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 2 Section 02150 "Clearing and Grubbing" for protection of existing trees and planting, and site clearing.
  - 2. Division 2 Section 02202 "Site Grading and Excavation" for excavation, filling, rough grading, and subsurface aggregate drainage and drainage backfill.

#### 1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product certificates signed by manufacturers certifying that their products comply with specified requirements.
  - 1. Manufacturer's certified analysis for standard products.
  - 2. Analysis for other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
- C. Samples of each of the following:
  - 1. 5 lb of mineral mulch for each color and texture of stone required for Project, in labeled plastic bags.
  - 2. Edging materials and accessories to verify color selected.
- D. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of architects and owners, and other information specified.
- E. Planting schedule indicating botanical and common names, size and condition, supplier's name, address and phone numbers, anticipated dates for delivery for each type of planting.

- F. Maintenance instructions recommending procedures to be established by Contracting Officer for maintenance of landscape work during entire year. Submit before expiration of required maintenance periods.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed a minimum of 5 years of landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful tree and shrub establishment.
  - 1. Installer's Field Supervision: Require a minimum of 5 years in plant installation that will provide full-time supervision on the Project site during times that tree and shrub planting is in progress.
- B. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Contracting Officer's representative's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
- C. Provide quality, size, genus, species, and variety of trees and shrubs indicated, complying with applicable requirements of ANSI Z60.1 "American Standard for Nursery Stock."
- D. Topsoil Analysis: Furnish a soil analysis made by a qualified independent soil-testing agency stating percentages of organic matter, inorganic matter (silt, clay, and sand), deleterious material, pH, and mineral and plant-nutrient content of topsoil.
  - 1. Report suitability of topsoil for growth of applicable planting material. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce a satisfactory topsoil.
- E. Measurements: Measure trees and shrubs according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4-inch caliper size, and 12 inches above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.
- F. Observation: Contracting Officer may observe trees and at the project site before planting for compliance with requirements for genus, species, variety, size and quality. Contracting Officer retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not prune before delivery, except as approved by Contracting Officer's representative. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy natural shape. Provide protective covering during delivery. Do not drop trees and shrubs during delivery.
- B. Handle balled and burlapped stock by the root ball.

- C. Deliver trees and shrubs after preparations for planting have been completed and install immediately. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist.
  - 1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
  - 2. Do not remove container-grown stock from containers before time of planting.
  - 3. Water root systems of trees and shrubs stored on site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

#### 1.6 COORDINATION AND SCHEDULING

- A. Coordinate planting of trees and shrubs during normal planting seasons for such work in location of Project.
  - 1. Plant frost-tender trees and shrubs only after danger of frost is past or before frost season to allow establishment before first frost. Do not plant in frozen ground.
- B. Coordination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns, unless otherwise acceptable to Contracting Officer's representative.
  - 1. When planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.

#### 1.7 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Government of other rights the Government may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Warrant living trees and shrubs through Contract completion against defects including death and unsatisfactory growth.
- C. Remove and replace dead trees and shrubs immediately unless required to plant in the succeeding planting season.
- D. Replace trees and shrubs that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
- E. A limit of one replacement of each tree and shrub will be required, except for losses or replacements due to failure to comply with requirements.

#### 1.8 MAINTENANCE

- A. Maintain trees and shrubs by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as required to keep trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings. Maintain trees and shrubs for the following period:
  - 1. Maintenance Period: 2 years following Substantial Completion.

### PART 2 - PRODUCTS

## 2.1 TREE AND SHRUB MATERIAL

- A. General: Unless otherwise indicated, furnish nursery-grown trees and shrubs conforming to ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. Grade: Provide trees and shrubs of sizes and grades conforming to ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Government representative, with a proportionate increase in size of roots or balls.
- C. Label each tree and shrub with securely attached, waterproof tag bearing legible designation of botanical and common name.

## 2.2 SHADE AND FLOWERING TREES

- A. Deciduous trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, conforming to ANSI Z60.1 for type of trees required. Provide single stem trees except where special forms are shown or listed.
- B. Small Trees: Small upright or spreading type, branched or pruned naturally according to species and type, and with relationship of caliper, height, and branching recommended by ANSI Z60.1. Provide single stem trees except where special forms are shown or listed.
- C. Provide balled and burlapped trees.

## 2.3 DECIDUOUS SHRUBS

- A. Form and Size: Deciduous shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub.
- B. Provide balled and burlapped deciduous shrubs.
- C. Container-grown deciduous shrubs will be acceptable in lieu of balled and burlapped deciduous shrubs subject to meeting ANSI Z60.1 limitations for container stock.

## 2.4 CONIFEROUS EVERGREENS

- A. Form and Size: Normal-quality, well-balanced, coniferous evergreens, of type, height, spread, and shape required, conforming to ANSI Z60.1.
- B. Provide balled and burlapped coniferous evergreens.

## 2.5 BALLED AND BURLAPPED STOCK

- A. Provide trees and shrubs dug with firm, natural ball of earth in which they are grown.
- B. Ball Size: Not less than diameter and depth recommended by ANSI Z60.1 for type and size of tree or shrub required. Increase ball size or modify ratio of depth to diameter to encompass enough fibrous and feeding-root system necessary for full recovery of trees and shrubs.

- C. Wrap, tie, and rigidly support earth ball as recommended by ANSI Z60.1 for size of balls required. Drum-lace balls with a diameter of 30 inches or greater.

## 2.6 CONTAINER-GROWN STOCK

- A. Provide healthy, vigorous, well-rooted shrubs established in container. Provide balled and burlapped stock when required shrubs exceed maximum size recommended by ANSI Z60.1 for container-grown stock.
  - 1. Established container stock is defined as a shrub transplanted into container and grown in container long enough to develop new fibrous roots, so that root mass will retain its shape and hold together when removed from container.
- B. Containers: Rigid containers that will hold ball shape and protect root mass during shipping. Provide trees and shrubs established in containers of not less than minimum sizes recommended by ANSI Z60.1 for kind, type, and size of trees and shrubs required.

## 2.7 TOPSOIL

- A. Topsoil: ASTM D 5268, fertile, friable, naturally loamy, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch or larger in any dimension, and other extraneous materials harmful to plant growth.
  - 1. Topsoil Source: Reuse surface soil stockpiled on the site. Verify suitability of surface soil to produce topsoil meeting requirements and amend when necessary. Supplement with imported topsoil when quantities are insufficient. Clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
  - 2. Topsoil Source: Import topsoil from off-site sources. Obtain topsoil from naturally well-drained sites where topsoil occurs at least 4 inches deep; do not obtain from bogs or marshes.

## 2.8 FERTILIZER

- A. Tree and shrub fertilizer: Slow release tablet form in the following composition.
  - 1. Agriform - Composition: 21 gram tablet, 20 percent total nitrogen, 10 percent phosphoric acid, 5 percent potash, 2.6 percent calcium, 1.6 percent sulfur, 0.35 percent iron.
  - 2. Or alternate approved by Contracting Officer's representative.

## 2.9 MULCHES

- A. Organic Mulch: Organic mulch, free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
  - 1. Type: Wood and bark chips.
- B. Mineral Mulch: Hard, durable stone, washed free of loam, sand, clay, and other foreign substances, of following type, size range, and color:
  - 1. Type: Rounded riverbed gravel or smooth-faced stone.
  - 2. Type: Crushed stone or gravel.
  - 3. Size Range: 3 inch maximum, 1 1/2 inch minimum.
  - 4. Color: Readily available natural gravel color range.

2.10 WEED-CONTROL BARRIERS

- A. Nonwoven Fabric: Polypropylene or polyester fabric, 3 oz. per sq. yd. minimum.
- B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz. per sq. yd.

2.11 STAKES AND GUYS

- A. Provide staking as shown in the planting details of plans.
- B. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long.

2.12 LANDSCAPE EDGINGS

- A. Polyethylene Edging: Manufacturer's standard-grooved, base-black polyethylene edging, 1/10 inch thick by 5 inches deep, unless otherwise indicated, extruded in standard lengths, with 9-inch steel angle stakes.
  - 1. Top Profile: Rounded.
  - 2. Accessories: Manufacturer's standard connecting clips or plugs.

2.13 MISCELLANEOUS MATERIALS

- A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's instructions.
- B. Vitamin B1 - root stimulator
- C. Trunk-Wrap: Vinyl tree wrap, 3ft. length - Ross TreeGard or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive trees and shrubs for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Contracting Officer's acceptance of layout before planting. Make minor adjustments as may be required.
- B. Lay out trees and shrubs at locations directed by Contracting Officer's. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

### 3.3 EXCAVATION

- A. Pits and Trenches: Excavate with vertical sides and with bottom of excavation slightly raised at center to assist drainage. Loosen hard subsoil in bottom of excavation. Scarify any hardpan on side of tree or plant hole which has been caused by digging or augering process.
- B. Balled and Burlapped Trees and Shrubs: Excavate approximately 1-1/2 times as wide as ball diameter and equal to ball depth, plus the following setting layer depth:
  - 1. Setting Layer: Allow 3 inches of planting soil.
- C. Container-Grown Shrubs: Excavate to approximately 1-1/2 times as wide as container width and equal to container depth, plus the following setting-layer depth:
  - 1. Setting Layer: Allow 3 inches of planting soil.
- D. Obstructions: Notify Contracting Officer if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
- E. Fill excavations with water and allow to percolate out, before placing setting layer and positioning trees and shrubs.

### 3.4 PLANTING TREES AND SHRUBS

- A. Set balled and burlapped stock plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.
  - 1. Place stock on setting layer of compacted backfill soil.
  - 2. Remove burlap from tops of balls and partially from sides, but do not remove from under balls. Remove non-biodegradable wrapping material around root balls before setting. Do not use planting stock if ball is cracked or broken before or during planting operation.
  - 3. Backfill material will consist of the soil removed from the hole during excavation and topsoil, mixed in the ratio of 1:1. Remove any roots, plants, sod, stones larger than 3 inches, clay lumps and other extraneous materials harmful to plant growth.
  - 4. Add tree and shrub fertilizer to backfill using manufacturer's specifications.
  - 5. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately 1/2 backfilled, water thoroughly before placing remainder of backfill. Apply Vitamin B-1 Root Stimulator at the rate of one tablespoon per gallon to all bare root stock plant materials. Thoroughly water each plant with a minimum of 5 gallons of the mixed B-1 solution.
  - 6. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.
- B. Set container-grown stock plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.
  - 1. Carefully remove containers so as not to damage root balls.
  - 2. Place stock on setting layer of compacted backfill soil.
  - 3. Tease encircling roots to loosen.
  - 4. Backfill material will consist of the soil removed from the hole during excavation and topsoil, mixed in the ratio of 1:1. Remove any roots, plants, sod, stones larger than 3 inches, clay lumps and other extraneous materials harmful to plant growth.
  - 5. Add tree and shrub fertilizer to manufacturer's specifications.
  - 6. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately 1/2 backfilled, water thoroughly before placing remainder of backfill. Apply Vitamin B-1 Root Stimulator at the rate of one tablespoon per gallon to all bare root stock plant materials. Thoroughly water each plant with a minimum of 5 gallons of the mixed B-1 solution.

7. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.

- C. Dish and tamp top of backfill to form a 3-inch high mound around the rim of the pit. Do not cover top of root ball with backfill.
- D. Wrap trees with trunk-wrap. Start at base of trunk and spiral cover trunk to height of first branches.

### 3.5 PRUNING

- A. Prune trees and shrubs only to remove broken branches or at direction of Government representative.

### 3.6 GUYING AND STAKING

- A. Upright staking and Tying: Stake all trees within 24 hours of planting. Use a minimum of 2 stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend at least 54 inches above grade. Set vertical stakes and space to avoid penetrating balls or root masses. Support trees with 2 strands of tie wire encased in hose sections at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree. Use number of stakes as follows:
  1. Two stakes for trees up to 10 feet high and 2-1/2 inches or less in caliper. Use 3 stakes for trees less than 14 feet high and up to 4-inch caliper. Space stakes equally around trees.
- B. Guying and Staking: Guy and stake all evergreen trees within 24 hours of planting, unless otherwise indicated. Securely attach no fewer than 3 guys to stakes 30 inches long, driven to grade.
  1. Attach flags to each guy wire, 30 inches above finish grade.

### 3.7 MULCHING

- A. Mulch backfilled surfaces of pits, trenches, and other areas indicated.
- B. Weed-Control Barriers: Install the following weed-control barriers according to manufacturer's recommendations, before mulching. Completely cover area to be mulched, lapping edges a minimum of 6 inches.
  1. Material and Seam Treatment: Nonwoven fabric with seams pinned.
  2. Material and Seam Treatment: Composite fabric with seams pinned.
- C. Organic Mulch: Apply the following average thickness of organic mulch and finish level with adjacent finish grades. Do not place mulch against trunks or stems.
  1. Thickness: 4 inches.
- D. Mineral Mulch: Apply the following average thickness of mineral mulch and finish level with adjacent finish grades. Mulch is to be the full 4inch thickness in all areas, including adjacent to drives, walkways and edgings. Do not place mulch against trunks or stems until vinyl trunk protection has been installed.
  1. Thickness: 4 inches.

3.8 INSTALLATION OF EDGINGS

- A. Plastic Edging: Install plastic edging where indicated according to manufacturer's recommendations. Anchor with steel stakes spaced approximately 24 inches apart, driven through upper base grooves of edging.

3.9 INSTALLATION OF MISCELLANEOUS MATERIALS

- A. Apply antidesiccant using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage.
  - 1. Apply as per manufacturer's instructions for Balled and burlapped and container stock.

3.10 CLEANUP AND PROTECTION

- A. During tree and shrub work, keep pavements clean and work area in an orderly condition.
- B. Protect trees and shrubs from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.11 DISPOSAL OF SURPLUS AND WASTE MATERIAL

- A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Government's property.

END OF SECTION 02955

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## SECTION 03300 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes.
- B. See Division 2 Section "Earthwork" for drainage fill under slabs-on-grade.

#### 1.2 SUBMITTALS

- A. Product Data: For each manufactured material and product indicated.
- B. Design Mixes: For each concrete mix indicated.
- C. Shop Drawings: Include details of steel reinforcement placement including material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports.
- D. Material test reports.

#### 1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- B. Comply with ACI 301, "Specification for Structural Concrete," including the following, unless modified by the requirements of the Contract Documents.
  - 1. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.
  - 2. Formwork and form accessories.
  - 3. Steel reinforcement and supports.
  - 4. Concrete mixtures.
  - 5. Handling, placing, and constructing concrete.

### PART 2 - RODUCTS

#### 2.1 MATERIALS

- A. Formwork: Furnish formwork and form accessories according to ACI 301.
- B. Steel Reinforcement:
  - 1. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
  - 2. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.
  - 3. Bar Supports: CRSI MSP-2-98, Chapter 3 "Bar Supports"
  - 4. Tie Wire: 16.5 gage or heavier, black annealed

C. Concrete Materials:

1. Portland Cement: ASTM C 150, Type V.
2. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding 1-inch nominal size.
3. Water: Complying with ASTM C 94.

D. Admixtures:

1. Air-Entraining Admixture: ASTM C 260.
2. Water-Reducing Admixture: ASTM C 494, Type A.
3. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
4. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

E. Vapor Retarder: Multi-ply reinforced polyethylene sheet, ASTM E 1745, Class C, not less than 20 mils thick; or polyethylene sheet, ASTM D 4397, not less than 20 mils .

1. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a No. 4 sieve and 10 to 30 percent passing a No. 100 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

F. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

G. Curing Materials:

1. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
2. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf.
3. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
4. Water: Potable.
5. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

## 2.2 CONCRETE MIXES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Compressive Strength (28 Days): 3000 psi.
2. Slump: 4 inches.
  - a. Slump Limit for Concrete Containing High-Range Water-Reducing Admixture: Not more than 8 inches after adding admixture to plant- or site-verified, 2- to 3-inch slump.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 6.0 percent within a tolerance of plus or minus 1.5 percent.

1. Air content of trowel-finished interior concrete floors shall not exceed 3.0 percent.

## 2.3 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with ASTM C 94.
  - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Formwork: Design, construct, erect, shore, brace, and maintain formwork according to ACI 301.
- 1. Vapor Retarder: Install, protect, and repair vapor-retarder sheets according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour. Lap joints 6 inches and seal with manufacturer's recommended tape.
- B. Steel Reinforcement: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- C. Joints: Construct joints true to line with faces perpendicular to surface plane of concrete.
  - 1. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by CO.
  - 2. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
    - a. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
  - 3. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into 225 square foot areas. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
    - a. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.  
Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks. Tolerances: Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

### 3.2 CONCRETE PLACEMENT

- A. Comply with recommendations in ACI 301 for measuring, mixing, transporting, and placing concrete.
- B. Do not add water to concrete during delivery, at Project site, or during placement. Consolidate concrete with mechanical vibrating equipment.

### 3.3 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.
  - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Completely remove fins and other projections.
  - 1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
  - 2. Do not apply rubbed finish to smooth-formed finish.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### 3.4 FINISHING UNFORMED SURFACES

- A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.
  - 1. Do not further disturb surfaces before starting finishing operations.
- C. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
- D. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

### 3.5 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions occur before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Cure formed and unformed concrete for at least seven days as follows:
  - 1. Moisture Curing: Keep surfaces continuously moist with water.

### 3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Tests will be performed according to ACI 301 and General Structural Requirements.
  - 1. Testing Frequency: At least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mix/batch placed each day. Reference General Structural Requirements.

END OF SECTION 03300

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SECTION 03301 – PORTLAND CEMENT CONCRETE FOR UTILITY AND DUCTBANK  
ENCASEMENT

PART 1 – GENERAL

1.01 CEMENT

- A. Portland Cement concrete for utility ductbank encasement shall be composed of Portland Cement, Type 1 or 1A, water, fine aggregate, coarse aggregate, accelerator admixture, and high range water-reducer. This specification shall be used in areas requiring immediate backfill of ductbank excavations.

PART 2 - APPLICABLE PUBLICATIONS:

2.01 PUBLICATIONS

- A. The publications listed below form a part of these specifications to the extent referenced. The publications are referred to in the text by the basic designation only.

2.02 American Society of Testing and Materials (ASTM) Publications:

ASTM C-31	Method of Making and Curing Concrete Test Specimens in the Field
ASTM C-33	Specification for Concrete Aggregates
ASTM C-39	Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C-94	Specification for Ready-Mixed Concrete
ASTM C-143	Test Method for Slump of Portland Cement Concrete
ASTM C-150	Specification for Portland Cement
ASTM C-231	Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C-494	Standard Specifications for Chemical Admixtures for Concrete
ASTM C-1017	Standard Specifications for Chemical Admixtures for Use in Producing Flowing Concrete

PART 3 - CONCRETE MATERIALS

3.01 CEMENT

- A. Regular Portland Cement: Regular Portland Cement shall conform to all the requirements of ASTM C-150 for Type V.

- B. Air-Entraining Portland Cement: Air-entraining Portland Cement shall conform to all the requirements of ASTM C-150 for Type V.

3.02 CONCRETE AGGREGATE

A. Concrete aggregate shall conform to ASTM C-33: The maximum size of the aggregate shall be 3/4 inch.

### 3.03 WATER USED IN CONCRETE

A. Water used in concrete shall be clean and free from deleterious amounts of acids, alkalis, organic matter, or other deleterious materials.

### 3.04 CHEMICAL ADMIXTURES

A. Air-Entraining Admixture: The Contractor may elect to use a regular Portland Cement Type 1 with the addition of an air-entraining admixture. Air-entraining admixtures to be used with Type 1 cement shall be Darex AEA, Neutralized Vinsol Resin Portex or equal. The air-entraining characteristics of the admixtures shall be such that the resulting concrete will have a satisfactory workability and the total air content shall be 3% - 6%. The air content of the concrete shall be determined by ASTM C-231.

B. Accelerating Admixture: Accelerating admixtures shall conform to the requirements of ASTM C-494 for Type C.

C. High Range Water Reducer (HRWR): High Range Water Reducer (HRWR) shall conform to the requirements of ASTM C-1017 for Type I. The proportioning of HRWR shall be such that the concrete has adequate slump during placement with a minimum slump loss of 3 inches within 30 minutes of placement.

### 3.05 TESTING OF MATERIALS

A. All tests which are necessary to determine compliance of the concrete materials with these specification will be performed by a qualified testing laboratory, and paid for by the Contractor.

## PART 4 – CONSTRUCTION

### 4.01 STORAGE OF MATERIALS

A. Cement and aggregates shall be stored at the site in such a manner as to prevent deterioration or intrusion of foreign matter. Any material which has deteriorated or which has been damaged shall not be used for concrete.

### 4.02 CONCRETE MIXTURE REQUIREMENTS

A. The concrete shall meet the following requirements:  
TABLE OF REQUIREMENTS

PROPERTY	MIN.	MAX.
Cement Factor (sacks per c.y.)	6.5	---
Water-Cement Ratio (gal. per sack)	---	4.0
Entrained Air (Percent)	3.0	6.0
Slump (inches)	4	7
Slump Loss After 30 minutes (inches)	3	---
Maximum Size of Aggregate	---	3/4"
Minimum Compressive Strength		
8 hour (psi)	600	---
7 day (psi)	2400	---
28 day (psi)	3500	---

B. Concrete shall be uniformly plastic, cohesive, and workable. Workable concrete is defined as concrete, which can be placed without honeycomb and without voids in the surface. Workability shall be obtained without producing a condition such that free water appears on the surface when finished. The consistency of the mixture shall be that required for the specific conditions and methods of placement; however, the previously determined maximum water-cement ratio shall not be exceeded.

C. The Contractor shall provide a concrete mixture design that complies with these specifications. Modifications will be made in the material proportions as are necessary to provide satisfactory concrete. The properties of the concrete will be determined according to the ASTM C-231 for air content, ASTM C-39 for compressive strength, and ASTM C-143 for slump.

#### 4.03 PROPORTIONING OF MATERIALS

A. All materials shall be separately and accurately measured by weight and each batch shall be uniform. The coarse and fine aggregates shall be weighed separately. A sack of cement shall weigh 94 pounds. When bulk cement is used, 94 pounds shall be considered as one sack.

B. The Contractor shall furnish and use weighing devices which will supply the exact quantity of materials for the class of concrete. The method of measuring concrete materials shall be such that the proportions can be accurately controlled and easily checked at any time during the work. Measurement of materials for ready-mixed concrete shall conform to ASTM C-94. The cement shall not remain in contact with the aggregate more than forty-five (45) minutes before being deposited into the mixer.

#### 4.04 MIXING

A. The mixing machine used shall be a standard type known as a batch mixer. The concrete shall be mixed until there is a uniform distribution of the materials and shall be discharged completely before the mixer is recharged.

B. The High Range Water Reducer shall be added to the concrete batch at the job site and adequately mixed prior to placement.

C. For job mixed concrete, the mixer shall be rotated at a speed recommended by the manufacturer and mixing shall be continued for at least two (2) minutes after all materials are in the mixer.

D. Ready-mixed concrete shall be mixed and delivered in accordance with the requirements set forth in ASTM C-94.

E. Concrete shall be conveyed from the mixer to the place of final deposit by methods which will prevent the separation or loss of the materials.

## PART 5 – PLACEMENT AND FINISH

### 5.00 PLACEMENT

A. The extent and dimensions of concrete shall conform to the limits shown on the construction drawings and details regarding concrete encased ductbank.

### 5.01 DESCRIPTION OF WORK

A. The placing and finishing of concrete for utility ductbank encasement, as described in this section, shall include all forming, placing, and finishing.

### 5.02 CASING BLOCK MATERIAL

A. The Contractor shall provide material that shall be placed over the ends of utility casing to prevent the intrusion of concrete into the casing. The blockage material shall be approved by the Contracting Officer.

### 5.03 PLACING OF CONCRETE

A. The Contractor shall give notice sufficiently in advance of placing concrete to permit inspection of the utility ductbank and trench.

B. After the completion of mixing, the concrete shall be rapidly conveyed to and deposited. The concrete shall be deposited in such a manner as will prevent the separation of the ingredients and permit the most thorough compaction. It shall be compacted by spading or by use of a mechanical vibrator until the ingredients have settled in the proper place and all honeycombed areas are eliminated.

C. The concrete shall be placed in such a manner as to prevent excessive crawling and segregation of the aggregate. No concrete shall be used that has partially set before final placing, nor will re-tempering be permitted. All concrete shall be placed in the ductwork trench no more than 60 minutes after being mixed.

D. The extent and dimensions of concrete shall conform to the limits shown on the construction drawings and details regarding concrete encased ductbanks.

E. Concrete shall be allowed to cure for a minimum of 24 hours before any backfilling is performed.

### 5.04 FREEZING WEATHER

A. No concrete work shall be done if the air temperature is below 40°F., or if the weather forecast predicts freezing weather before the final set of the concrete, unless special means of heating and protecting the work are used.

B. When placing concrete with the air temperature below 40°F, the aggregate and mixing water shall be heated to a temperature which, when combined, will give a resultant concrete temperature between 55°F. and 70°F. at the batch plant. The concrete, upon arrival at the site, shall have a temperature between 55°F. and 70°F. Adequate measures shall be employed to protect the concrete from dropping below 50°F for a period of at least 80 hours following placement. Care shall be taken to provide an even heating temperature so that all parts of the freshly poured concrete are maintained at no less than the minimum temperature.

C. Concrete laid on the ground, or other similar concrete construction, may be protected against freezing with insulation or other acceptable material. No concrete shall be poured against frozen ground.

D. The use of salt or other compounds to prevent concrete from freezing will not be permitted. Any work which

has been injured by freezing shall be removed and replaced at the Contractor's expense.

5.05 FINISH

A. The surface of the concrete shall be graded level and rough-troweled.

5.06 FIELD TEST SPECIMENS

A. During the progress of the work, compression test specimens shall be made and cured in accordance with ASTM C-31.

B. Curing Specimens.

1. Concrete strength specimens made to check the adequacy of the field mixture and the materials shall be sent to the testing lab for curing following a 24-hour field cure. Any further field curing after the initial 24-hour period shall be done at a temperature of 65°F to 80°F. and under a constant moist condition. Specimens shall not be exposed to a stream of running water. If storage in water is desired, a saturated lime solution shall be used.

C. Cylinder Tests.

1. Concrete test cylinders will be made by the Engineer. The Contractor shall provide cylinder molds and shall have the cylinder tested by an approved laboratory and the Contractor bearing all costs of such testing and shipping. The Contractor will not be allowed to pour concrete until cylinder molds are provided to the Engineer.

2. The cylinders shall be tested in accordance with ASTM C-39, (two cylinders each) and may be required for each day's run, or in larger pours, for each 50 cubic yards cast each day.

D. Compressive Strength Requirements.

1. If the compressive strength of specimen cylinders falls below the compressive strengths required for various classes of concrete as specified, the mix shall be revised to secure a concrete meeting the strength requirements.

E. When the compressive strength of concrete falls below the minimum requirement, the concrete shall be rejected.

F. Evaluation of Concrete Strength.

1. Concrete sampled by a strength test shall be considered satisfactory if the average test of the two specimens exceeds the specified strength and neither specimen test falls below 95% of the specified strength. However, if any specimen test strength falls at or below the specified strength, the mix design shall be considered inadequate and shall be modified for a higher strength unless results of at least six consecutive previous specimen tests for this project exceeded the specified strength.

END OF SECTION 03301

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## SECTION 03302 -CAST-IN-PLACE SITE CONCRETE ELEMENTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes.
- B. See Division 2 Section "Earthwork" for drainage fill under slabs-on-grade.

#### 1.2 SUBMITTALS

- A. Product Data: For each manufactured material and product indicated.
- B. Design Mixes: For each concrete mix indicated.
- C. Shop Drawings: Include details of steel reinforcement placement including material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports.
- D. Material certificates and test reports.

#### 1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- B. Comply with ACI 301, "Specification for Structural Concrete," including the following, unless modified by the requirements of the Contract Documents.
  - 1. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.
  - 2. Formwork and form accessories.
  - 3. Steel reinforcement and supports.
  - 4. Concrete mixtures.
  - 5. Handling, placing, and constructing concrete.
  - 6. Lightweight concrete.
- C. Preinstallation Conference: Conduct conference at Project site.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Formwork: Furnish formwork and form accessories according to ACI 301.
- B. Steel Reinforcement:
  - 1. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
  - 2. Plain-Steel Wire: ASTM A 82, as drawn.
  - 3. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
  - 4. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.

C. Concrete Materials:

1. Portland Cement: ASTM C 150, Type V.
2. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding 1-1/2-inch nominal size.
3. Lightweight Aggregate: ASTM C 330.
4. Water: Complying with ASTM C 94.
5. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches long.

D. Admixtures:

1. Air-Entraining Admixture: ASTM C 260.
2. Water-Reducing Admixture: ASTM C 494, Type A.
3. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

E. Vapor Retarder: Multi-ply reinforced polyethylene sheet, ASTM E 1745, Class C, not less than 7.8 mils thick; or polyethylene sheet, ASTM D 4397, not less than 10 mils thick.

1. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a No. 4 sieve and 10 to 30 percent passing a No. 100 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

F. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

G. Curing Materials:

1. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
2. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf.
3. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
4. Water: Potable.
5. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
6. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

## 2.2 CONCRETE MIXES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Compressive Strength (28 Days): 3000 psi.
2. Slump: 4 inches.

- a. Slump Limit for Concrete Containing High-Range Water-Reducing Admixture: Not more than 8 inches after adding admixture to plant- or site-verified, 2- to 3-inch slump.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 2.5 to 4.5 percent.
  - 1. Air content of trowel-finished interior concrete floors shall not exceed 3.0 percent.
- D. Lightweight Structural Concrete Mix: ASTM C 330, proportioned to produce concrete with a minimum compressive strength of 3000 psi at 28 days and a calculated equilibrium unit weight of 110 lb./cu. ft. plus or minus 3 lb./cu. ft., as determined by ASTM C 567. Concrete slump at point of placement shall be the minimum necessary for efficient mixing, placing, and finishing.
  - 1. Limit slump to 5 inches for troweled slabs and 4 inches for other slabs.
- E. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb./cu. yd..

## 2.3 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with ASTM C 94 and ASTM C 1116.
  - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.
  - 1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
  - 2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
- C. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Formwork: Design, construct, erect, shore, brace, and maintain formwork according to ACI 301.
- B. Vapor Retarder: Install, protect, and repair vapor-retarder sheets according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.
  - 1. Lap joints 6 inches and seal with manufacturer's recommended tape.
  - 2. Cover vapor retarder with fine-graded granular material, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch or minus 3/4 inch.
- C. Steel Reinforcement: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
  - D. Joints: Construct joints true to line with faces perpendicular to surface plane of concrete.
    1. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by Architect.
    2. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
      - a. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
    3. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
      - a. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
      - b. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
  - E. Tolerances: Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- 3.2 CONCRETE PLACEMENT
- A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.
  - B. Do not add water to concrete during delivery, at Project site, or during placement.
  - C. Consolidate concrete with mechanical vibrating equipment.
- 3.3 FINISHING FORMED SURFACES
- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.
    1. Apply to concrete surfaces not exposed to public view.
  - B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Completely remove fins and other projections.
    1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
    2. Do not apply rubbed finish to smooth-formed finish.

3. Apply smooth-rubbed finish, defined in ACI 301, to smooth-formed finished concrete.

- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### 3.4 FINISHING UNFORMED SURFACES

- A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.

1. Do not further disturb surfaces before starting finishing operations.

- C. Scratch Finish: Apply scratch finish to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finish, unless otherwise indicated.
- D. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- E. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
- F. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.
- G. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

### 3.5 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions occur before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Cure formed and unformed concrete for at least seven days as follows:

1. Moisture Curing: Keep surfaces continuously moist with water.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

### 3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Tests will be performed according to ACI 301.
  1. Testing Frequency: One composite sample for each day's pour of each concrete mix exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
  2. Testing Frequency: At least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.

END OF SECTION 03300

## SECTION 04200 - MASONRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes unit masonry assemblies consisting of the following:
  - 1. Concrete masonry units.

#### 1.2 SUBMITTALS

- A. Product Data: For each masonry unit, accessory, and other manufactured product indicated.
- B. Shop Drawings: For masonry reinforcing bars; comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
- C. Samples: Showing the full range of colors and textures available for exposed masonry units and colored mortars.
- D. Material Test Reports: For each type of masonry unit, mortar, and grout required.
- E. Material Certificates: For each type of masonry unit required.

#### 1.3 QUALITY ASSURANCE

- A. Pre-construction Testing Service: Engage a qualified independent testing agency to perform pre-construction testing on each type of unit required per test method indicated.
  - 1. Concrete Masonry Units: ASTM C 140.
  - 2. Mortar: For properties per ASTM C 270.
  - 3. Grout: For compressive strength per ASTM C 1019.
- B. Mockups: Build sample panels for each type of exposed unit masonry assembly to verify selections made under sample Submittals and to demonstrate aesthetic effects.
  - 1. Build mockups in sizes approximately 48 inches long by 40 inches high by full thickness.

#### 1.4 PROJECT CONDITIONS

- A. Cold-Weather Requirements: Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements in ACI 530.1/ASCE 6/TMS 602.
- B. Hot-Weather Requirements: When ambient temperature exceeds 100 deg F, or 90 deg F with a wind velocity greater than 8 mph, do not spread mortar beds more than 48 inches ahead of masonry. Set masonry units within one minute of spreading mortar.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
  - 2. Products: Subject to compliance with requirements, provide one of the products specified.

### 2.2 COLORS AND TEXTURES

- A. Exposed Masonry Units: As selected by Contracting Officer from manufacturer's full range.

### 2.3 MASONRY UNITS

- A. Concrete Masonry Units: ASTM C 90.
  - 1. Weight Classification: Normal weight.
  - 2. Type: I, moisture-controlled units.
  - 3. Exposed Faces of Decorative Units: Normal-weight aggregate, split-face finish .
- B. Prefaced Concrete Masonry Units: ASTM C 744, lightweight concrete units with manufacturer's standard smooth resinous tile facing.
  - 1. Concrete Masonry Units: ASTM C 90, Type I, moisture-controlled, hollow units.
  - 2. Size: Manufactured with prefaced surfaces having 1/16-inch- wide returns of facing to create 1/4-inch- wide mortar joints with modular coursing.
- C. Front Entry Signs
  - 1. Masonry Wall
    - a. Masonry units color as approved by Contracting Officer.
    - b. Mortar color as approved by Contracting Officer.
    - c. Reinforced concrete: 3000 psi
  - 2. Sign Letters
    - a. Individual letter shall be non-removable after installation with size, spacing, color and design as approved by Contracting Officer.
    - b. Two (2) ground level lights provide illumination. Letters to be fabricated from .090 inch aluminum, heliarc welded construction. Letters to be completely sanded, etched, and degreased by immersion to receive baked enamel finish. Manufacturer shall include full-size mounting template and hardware for masonry installation.
    - c. Title: "TITAN VILLAGE"
  - 3. Letter Manufactures
    - a. Amdco Industries Corp.
    - b. Greensboro
    - c. Or approved equal
  - 4. Submit full size samples for approval

5. Submit shop drawings indicating font style, finish, profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
6. Provide full size installation template for approval.

## 2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Mortar Cement: ASTM C 1329.
  1. Available Products:
    - a. Blue Circle Cement; Magnolia Superbond Mortar Cement.
    - b. Lafarge Corporation; Lafarge Mortar Cement.
    - c. Or Equal
- D. Masonry Cement: ASTM C 91.
- E. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
- F. Aggregate for Grout: ASTM C 404.
- G. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by the manufacturer for use in masonry mortar of composition indicated.
  1. Available Products:
    - a. Euclid Chemical Co.; Accelguard 80.
    - b. Grace, W. R. & Co., Construction Products Division; Morseled.
    - c. Sonneborn, Div. of ChemRex, Inc.; Trimix-NCA.
    - d. Or Equal
- H. Water: Potable.

## 2.5 REINFORCING

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement 1; or ASTM A 617/A 617M, Grade 60.
- B. Masonry Joint Reinforcement: ASTM A 951; mill galvanized, carbon-steel wire for interior walls and hot-dip galvanized, carbon-steel wire for exterior walls.
  1. Wire Size for Side Rods: W1.7 or 0.148-inch diameter.
  2. Wire Size for Cross Rods: W1.7 or 0.148-inch diameter.
  3. Single-Wythe Masonry: Use either ladder or truss type with single pair of side rods and cross rods spaced not more than 16 inches o.c.
  4. Retain below for cavity and composite walls.

## 2.6 TIES AND ANCHORS

- A. Materials, General: As follows, unless otherwise indicated:
  - 1. Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating for exterior walls and Class 1 coating for interior walls.
  - 2. Galvanized Steel Sheet: ASTM A 366/A 366M cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153, at exterior walls; and ASTM A 653/A 653M, G60, commercial-quality, steel sheet zinc coated by hot-dip process on continuous lines before fabrication at interior walls.
- B. Bent Wire Ties: Rectangular units with closed ends and not less than 4 inches wide, made from 3/16-inch- diameter, galvanized steel wire.

## 2.7 MASONRY CLEANERS

- A. Job-Mixed Detergent Solution: Solution of 1/2-cup dry measure tetrasodium polyphosphate and 1/2-cup dry measure laundry detergent dissolved in 1 gal. of water.
- B. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

## 2.8 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, unless otherwise indicated. Do not use calcium chloride in mortar or grout.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification.
- C. Pigmented Mortar: Select and proportion pigments with other ingredients to produce color required. Limit pigments to the following percentages of cement content by weight:
  - 1. For portland cement-lime mortar, not more than 10 percent.
  - 2. For masonry cement or mortar cement mortar, not more than 5 percent.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
  - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 5 of ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
  - 2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.

## 2.9 SOURCE QUALITY CONTROL

- A. Concrete Masonry Unit Tests: For each type of concrete masonry unit indicated, units will be tested according to ASTM C 140.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Cut masonry units with motor-driven saws. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
- C. Wetting of Brick: Wet brick before laying if the initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at the time of laying.

### 3.2 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thickness and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Lay exposed masonry in bond pattern indicated; do not use units with less than nominal 8-inch horizontal face dimensions at corners.
- C. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

### 3.3 MORTAR BEDDING AND JOINTING

- A. Lay hollow masonry units as follows:
  - 1. With full mortar coverage on horizontal and vertical face shells.
  - 2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
  - 3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.

### 3.4 CAVITIES

- A. Keep cavities clean of mortar droppings and other materials during construction.
  - 1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.

### 3.5 MASONRY JOINT REINFORCEMENT

- A. Provide continuous masonry joint reinforcement as indicated. Install with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.

- B. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections.

### 3.6 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.
  - 1. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
  - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

### 3.7 PARGING

- A. Parge predampened masonry walls, where indicated, with Type S or Type N mortar applied in 2 uniform coats to a total thickness of 3/4 inch with a steel-trowel finish. Form a wash at top of parging and a cove at bottom. Damp-cure parging for at least 24 hours.

### 3.8 CLEANING

- A. Clean unit masonry by dry brushing to remove mortar fins and smears before tooling joints, as work progresses.
- B. After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
  - 2. Protect adjacent surfaces from contact with cleaner.
  - 3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
  - 4. Clean brick by the bucket-and-brush hand-cleaning method described in BIA Technical Notes No. 20, using job-mixed detergent solution.
  - 5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
  - 6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.

3.9 MASONRY WASTE DISPOSAL

- A. Masonry Waste Disposal: Dispose of clean masonry waste, including broken masonry units, waste mortar, and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.
  - 1. Do not dispose of masonry waste as fill within 18 inches of finished grade.
  - 2. Remove excess, clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04200

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## SECTION 05120 - STRUCTURAL STEEL

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes structural steel
- #### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components.
- C. Welding certificates.
- D. Mill test reports.
- E. Source quality-control test reports.

#### 1.3 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category Sbd.
- B. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel."
- C. Comply with applicable provisions of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

### PART 2 - PRODUCTS

#### 2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 572, Grade 50
- B. Channels, Angles: ASTM A 572, Grade 50.
- C. Plate and Bar: ASTM A 36
- D. Welding Electrodes: Comply with AWS requirements: E70XX

#### 2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
  - 1. Finish: Plain.
- B. Threaded Rods: ASTM A 36/.
  - 1. Finish: Plain

2.3 PRIMER

- A. Primer: SSPC-Paint 25, Type II, iron oxide, zinc oxide, raw linseed oil, and alkyd.
- B. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer.

2.4 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design."

2.5 SHOP PRIMING

- A. Shop prime steel surfaces except as noted in the General Structural Requirements.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
  - 1. SSPC-SP 2, "Hand Tool Cleaning."
  - 2. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

PART 3 - EXECUTION

3.1 ERECTION

- A. Examination: Verify elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design."
  - 1.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.2 FIELD CONNECTIONS

- A. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
  - 1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds

END OF SECTION 05120

## SECTION 05720 - ORNAMENTAL HANDRAILS AND RAILINGS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes ornamental metal handrails and railings.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Handrails and Railings:
  - 1. Comply with ASTM E 985, based on testing per ASTM E 894 and ASTM E 935.
  - 2. Capable of withstanding structural loads required by ASCE 7 without exceeding allowable design working stresses of materials involved.
  - 3. Capable of withstanding the following structural loads without exceeding the allowable design working stress of materials involved:
    - a. Top Rail of Guards: Concentrated load of 200 lbf applied at any point and in any direction, and a uniform load of 50 lbf/ft. applied horizontally and concurrently with uniform load of 100 lbf/ft. applied vertically downward. Concentrated and uniform loads need not be assumed to act concurrently.
    - b. Handrails Not Serving as Top Rails: Concentrated load of 200 lbf applied at any point and in any direction, and a uniform load of 50 lbf/ft. applied in any direction. Concentrated and uniform loads need not be assumed to act concurrently.
    - c. Infill Area of Guards: Horizontal concentrated load of 200 lbf applied to 1 sq. ft. at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area. Load on infill area need not be assumed to act concurrently with loads on top rails.
    - d. Glass-Supported Handrails and Railings: Same loads indicated for top rails and infill areas of guards based on a safety factor of 4, with each section of top rail supported by a minimum of three glass panels or by other means so top rail will remain in place if any one panel fails.

#### 1.3 SUBMITTALS

- A. Product Data: For handrails and railings, grout, anchoring cement, and paint products indicated.
- B. Shop Drawings: Include plans, elevations, sections, details of installation, attachments to other Work, and structural computations.
- C. Samples: For each exposed finish required.
- D. Product Test Reports: Indicating handrails and railings comply with ASTM E 985.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. ACI Glass Products.
  - 2. Aluminum Tube Railings, Inc.

3. Architectural Metal Works.
4. Blum, Julius & Co., Inc.

## 2.2 METALS

### A. Steel and Iron:

1. Steel Tubing: ASTM A 500, grade as required by structural loads.
2. Steel Rails and Bars: ASTM A 29/A 29M, Grade 1010.
3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
4. Iron Castings: Malleable iron, ASTM A 47, Grade 32510.

## 2.3 MISCELLANEOUS MATERIALS

- A. Fasteners: Same basic metal as fastened metal; concealed, unless otherwise indicated or unavoidable, and standard with systems indicated.
- B. Anchors: Fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined per ASTM E 488.
- C. Shop Primers: Provide primers to comply with applicable requirements in Division 9 Section "Painting."
- D. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; with good resistance to corrosion; and compatible with finish paint systems indicated.
- E. Shop Primer for Galvanized Steel: SSPC-Paint 5, zinc-dust, zinc-oxide primer formulated for priming zinc-coated steel and for compatibility with finish paint systems indicated.
- F. Grout and Anchoring Cement: Premixed, nonshrink, nonmetallic grout complying with ASTM C 1107 or erosion-resistant, nonshrink anchoring cement; recommended by manufacturer for use indicated.

## 2.4 FABRICATION

- A. General: Fabricate to design, dimensions, and details indicated, but not less than that required to support structural loads.
  1. Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
- B. Form changes in direction of railing members by bending.
  1. Form curves by bending in jigs to produce uniform curvature without buckling, twisting, cracking, or otherwise deforming exposed surfaces.
- C. Welded Connections: Connect handrail and railing members by welding. Cope and weld or use welded-in fittings. Weld connections continuously.
- D. Brazed Connections: Connect copper-alloy handrails and railings members by brazing. Braze corners and seams continuously.

- E. Nonwelded Connections: Connect handrail and railing members with concealed mechanical fasteners and fittings.
- F. Fabricate splice joints for field connection using epoxy structural adhesive.
- G. Brackets, Flanges, Fittings, and Anchors: Fabricate wall brackets, flanges, miscellaneous fittings, and anchors to connect handrails and railings to other construction.
  - 1. Cast or form of same metal and finish as supported rails.
- H. Close exposed ends of handrail and railing members with prefabricated end fittings.
  - 1. Provide wall returns at ends of wall-mounted handrails.
- I. Factory-bond glass to aluminum base and top-rail channels in railing manufacturer's plant using glazing cement.

## 2.5 FINISHES

- A. Shop-Primed Steel Finish: Prepare per SSPC-SP 7, "Brush-off Blast Cleaning," and apply primer.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Installation, General: Perform cutting, drilling, and fitting required to install handrails and railings. Set units accurately in location, alignment, and elevation.
  - 1. Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
  - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
  - 3. Align rails so variations from level for horizontal members and from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- B. Anchor posts in concrete by inserting into preset steel pipe sleeves and grouting annular space.
- C. Anchor posts to metal surfaces with fittings designed for railing system and for this purpose.
- D. Attach handrails to wall with wall brackets or end fittings.
  - 1. For wood stud partitions, use hanger or lag bolts set into wood backing between studs.
  - 2. For steel-framed gypsum board assemblies, use hanger or lag bolts set into wood backing between studs or fasten to steel framing or concealed reinforcements using self-tapping screws of size and type required to support structural loads.
- E. Touch up painted surfaces and finishes after erection. Clean abraded areas and touch up paint with the same material as used for shop painting.

END OF SECTION 05720

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## SECTION 06100 - ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. This Section includes the following:

1. Wood framing.
2. Wood supports.
3. Wood blocking.
4. Wood cants.
5. Wood nailers.
6. Wood furring.
7. Wood sheathing.
8. Wood subflooring.
9. Wood underlayment.
10. Plywood backing panels.

#### 1.2 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product indicated.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that materials comply with requirements.

B. Research/Evaluation Reports: For the following:

1. Treated wood.
2. Power-driven fasteners.
3. Powder-actuated fasteners.
4. Expansion anchors.
5. Metal framing anchors.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Manufacturers: Subject to compliance with requirements.

#### 2.2 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Provide dressed lumber, S4S, unless otherwise indicated.
3. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.

B. Wood Structural Panels:

1. Plywood: Either DOC PS 1 or DOC PS 2, unless otherwise indicated.

- 2.3      2.      Oriented Strand Board: DOC PS 2.  
WOOD-PRESERVATIVE-TREATED MATERIALS
- A.      Preservative Treatment by Pressure Process: AWP C2 (lumber), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWP C31 with inorganic boron (SBX).
  - B.      Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber.
  - C.      Mark each treated item with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
  - D.      Application: Treat items indicated on Drawings, and the following:
    - 1.      Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
    - 2.      Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
    - 3.      Wood framing members less than 6 inches above grade.
    - 4.      Wood floor plates that are installed over concrete slabs directly in contact with earth.
- 2.4      DIMENSION LUMBER
- A.      General: Of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
  - B.      Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 2 grade and the following species:
    - 1.      Western woods; WCLIB or WWP.
  - C.      Framing Other Than Non-Load-Bearing Partitions: Construction or No. 2 grade and the following species:
    - 1.      Douglas fir-larch, Douglas fir-larch (north), or Douglas fir-south; NLGA, WCLIB, or WWP.
- 2.5      TIMBER AND MISCELLANEOUS LUMBER
- A.      For timbers of 5-inch nominal size and thicker, provide material complying with the following requirements:
    - 1.      Species and Grade: Douglas fir-larch, No. 1 grade; NLGA, WCLIB, or WWP.
  - B.      Provide miscellaneous lumber for support or attachment of other construction, including the following:
    - 1.      Cants.
    - 2.      Nailers.
    - 3.      Furring.
  - C.      For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with 19 percent maximum moisture content of any species.
  - D.      For concealed boards, provide lumber with 19 percent maximum moisture content and the following species and grades:
    - 1.      Western woods, Construction or No. 2 Common grade; WCLIB or WWP.
- 2.6      SHEATHING

- A. Plywood Wall Sheathing: Exposure 1 sheathing.
- B. Oriented-Strand-Board Wall Sheathing: Exposure 1 sheathing.
- C. Plywood Roof Sheathing: Exposure 1 sheathing.
- D. Oriented-Strand-Board Roof Sheathing: Exposure 1 sheathing.

## 2.7 SUBFLOORING AND UNDERLAYMENT

- A. Plywood Combination Subfloor-Underlayment: DOC PS 1, Exterior, C-C Plugged single-floor panels.
- B. Plywood Subflooring: Exterior single-floor panels or sheathing.
- C. Plywood Underlayment for Resilient Flooring: DOC PS 1, Exterior, C-C Plugged with fully sanded face.
- D. Plywood Underlayment for Carpet: DOC PS 1, Exterior, C-C Plugged.
- E. Particleboard Underlayment: ANSI A208.1, Grade PBU.

## 2.8 MISCELLANEOUS MATERIALS

- A. Fasteners:
  - 1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
  - 2. Power-Driven Fasteners: CABO NER-272.
  - 3. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- B. Metal Framing Anchors: Made from hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.
  - 1. Manufacturer:
    - a. Simpson Strong-Tie Company, Inc. or equivalent upon approval by CO
  - 2. Research/Evaluation Reports: Provide products acceptable to authorities having jurisdiction and for which model code research/evaluation reports exist that show compliance of metal framing anchors, for application indicated, with building code in effect for Project.
  - 3. Allowable Design Loads: Meet or exceed those indicated per manufacturer's published values determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- C. Building Paper: Asphalt-saturated organic felt complying with ASTM D 226, Type I (No. 15 asphalt felt), unperforated.

- D. Sheathing Tape: Pressure-sensitive plastic tape for sealing joints and penetrations in sheathing and recommended by sheathing manufacturer for use with type of sheathing required.
- E. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by both adhesive and panel manufacturers.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Apply field treatment complying with AWPAC M4 to cut surfaces of preservative-treated lumber and plywood.
- C. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. CABO NER-272 for power-driven fasteners.
  - 2. Published requirements of metal framing anchor manufacturer.
  - 3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in the Uniform Building Code.
- D. Use finishing nails for exposed work, unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
- E. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.
- F. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's instructions.
- G. Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," unless noted otherwise, for types of structural-use panels and applications indicated.
- H. Fastening Methods:
  - 1. Combination Subfloor-Underlayment: Glue and nail to wood framing.
  - 2. Subflooring: Glue and nail to wood framing.
  - 3. Sheathing: Nail to wood framing.
  - 4. Underlayment: Nail to subflooring.
  - 5. Plywood Backing Panels: Nail or screw to supports.
- I. Apply building paper horizontally with 2-inch overlap and 6-inch end lap; fasten to sheathing with galvanized staples or roofing nails. Cover upstanding flashing with 4-inch overlap.
- J. Apply sheathing tape to joints between sheathing panels and at items penetrating sheathing. Apply at upstanding flashing to overlap both flashing and sheathing.

END OF SECTION 06100

## SECTION 06105 - MISCELLANEOUS CARPENTRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Wood framing.
  - 2. Miscellaneous lumber.
  - 3. Interior wood trim.
  - 4. Shelving and clothes rods.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product indicated.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that materials comply with requirements.
- B. Research/Evaluation Reports: For the following:
  - 1. Preservative-treated wood.
  - 2. Fire-retardant-treated wood.
  - 3. Power-driven fasteners.

### PART 2 - PRODUCTS

#### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber indicated to receive stained or natural finish, mark grade stamp on end or back of each piece.
  - 3. Provide dressed lumber, S4S, unless otherwise indicated.
  - 4. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.
- B. Wood Structural Panels:
  - 1. Plywood: DOC PS 1 or DOC PS 2, unless otherwise indicated.

#### 2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPA C2 (lumber) and AWPA C9 (plywood), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).
- B. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
- C. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, and blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing members less than 6 inches above grade.
4. Wood floor plates that are installed over concrete slabs directly in contact with earth.

2.3 DIMENSION LUMBER

- A. General: Of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
- B. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 2 grade and the following species:
1. Northern species; NLGA.
  2. Western woods; WCLIB or WWPA.
- C. Other Framing: Construction or No. 2 Construction, Stud, or No. 2 grade and any of the following species:
1. Douglas fir-larch, Douglas fir-larch (north), or Douglas fir-south; NLGA, WCLIB, or WWPA.
  2. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA.

2.4 MISCELLANEOUS LUMBER

- A. Provide miscellaneous lumber for support or attachment of other construction, including the following:
1. Blocking.
  2. Nailers.
  3. Furring.
  4. Grounds.
- B. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with 19 percent maximum moisture content of any species.
- C. For exposed boards, provide lumber, with 19 percent maximum moisture content, of eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine; DSelect (Quality) Finish or 1 Common (Colonial) grade; NELMA, NLGA, WCLIB, or WWPA.
- D. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
1. Mixed southern pine, No. 2 grade; SPIB.
  2. Eastern softwoods, No. 2 Common grade; NELMA.
  3. Northern species, No. 2 Common grade; NLGA.
  4. Western woods, Construction or No. 2 Commo grade; WCLIB or WWPA.

2.5 INTERIOR WOOD TRIM

- A. Lumber Trim for Opaque Finish (Painted): Finished lumber (S4S), either finger-jointed or solid lumber, of one of the following species and grades:

1. Grade D Select eastern white pine; NELMA or NLGA.
2. Grade D Select (Quality) 1 Common (Colonial) Idaho white, ponderosa, or; NLGA or WWPA.
3. Moldings for Opaque Finish (Painted): P-grade primed medium-density fiberboard.

## 2.6 SHELVING AND CLOTHES RODS

- A. Shelving: 3/4-inch particleboard shelving with radiuses and filled front edge medium-density fiberboard shelving with radiuses front edge or boards of same species and grade indicated above for exposed boards.
- B. Clothes Rods: 1-1/2-inch- diameter, clear, kiln-dried softwood rods; either Douglas fir or southern pine.

## 2.7 PANEL PRODUCTS

- A. Miscellaneous Concealed Plywood: Exterior Exposure 1 sheathing, span rating to suit framing in each location, and thickness as indicated but not less than 1/2 inch.
- B. Particleboard Underlayment: ANSI A208.1, Grade PBU.
- C. Hardboard Underlayment: AHA A135.4, Class 4 (Service), Surface S1S; with backside sanded.

## 2.8 FASTENERS

- A. General: Where carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Power-Driven Fasteners: CABO NER-272.
- C. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Set carpentry to require levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.
- C. Countersink fastener heads on exposed carpentry work and fill holes with wood filler.
- D. Wood Structural Panels: Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.

- E. Wood Trim Installation: Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Cope at returns and miter at corners to produce tight-fitting joints. Use scarf joints for end-to-end joints.
  - 1. Match color and grain pattern across joints.
  - 2. Install trim after gypsum board joint-finishing operations are completed.
  - 3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximums offset for reveal installation.

END OF SECTION 06105

## SECTION 06176 - METAL-PLATE-CONNECTED WOOD TRUSSES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Wood roof trusses.
  - 2. Wood girder trusses.
  - 3. Truss accessories.
- B. See Division 6 Section "Rough Carpentry " for supplementary framing and permanent bracing.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads indicated without exceeding TPI 1 deflection limits.

#### 1.3 SUBMITTALS

- A. Product Data: For metal-plate connectors, metal framing anchors, bolts, and fasteners indicated.
- B. Shop Drawings: Show location, pitch, span, camber, configuration, and spacing for each type of truss required; species, sizes, and stress grades of lumber; splice details; type, size, material, finish, design values, orientation, and location of metal connector plates; and bearing details.
  - 1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Qualification Data: For the following:
  - 1. Metal-plate manufacturer.
  - 2. Fabricator.
- D. Research/Evaluation Reports: For the following:
  - 1. Metal-plate connectors.
  - 2. Metal framing anchors.

#### 1.4 QUALITY ASSURANCE

- A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with TPI quality-control procedures for manufacture of connector plates published in TPI 1.
  - 1. Manufacturer's responsibilities include preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

- B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that involves inspection by SPIB, Timber Products Inspection, TPI, or other independent testing and inspecting agency acceptable to C.O. and authorities having jurisdiction.
- C. Comply with TP11, "National Design Standard for Metal Plate Connected Wood Truss Construction," and TPI HIB, "Commentary and Recommendations for Handling, Installing & Bracing Metal Plate Connected Wood Trusses."
- D. Wood Structural Design Standard: Comply with applicable requirements in AFPA's "National Design Specifications for Wood Construction" and its "Supplement."

## PART 2 - PRODUCTS

### 2.1 DIMENSION LUMBER

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
- B. Grade and Species: Doug-Fir or Hem-Fir for truss chord and web members, graded visually or mechanically, and capable of supporting required loads without exceeding allowable design values according to AFPA's "National Design Specifications for Wood Construction" and its "Supplement."

### 2.2 METAL PRODUCTS

- A. Metal Connector Plates: Fabricate connector plates to comply with TPI1 from hot-dip galvanized steel sheet complying with ASTM A 653/A 653M, G60 coating designation; Designation SS, Grade 33, and not less than 0.036 inch thick.
- B. Fasteners: Where trusses are exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M. Fasteners below shall be designed/supplied by the truss supplier and shall at a minimum meet the criteria noted.
  - 1. Nails, Wire, Brads, and Staples: FS FF-N-105.
  - 2. Power-Driven Fasteners: CABO NER-272.
  - 3. Wood Screws: ASME B18.6.1.
  - 4. Lag Bolts: ASME B18.2.1..
  - 5. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- C. Metal Framing Anchors: Provide framing anchors made from hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

### 2.3 FABRICATION

- A. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.

## PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install and brace trusses according to TPI recommendations and as indicated. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
- B. Anchor trusses securely at bearing points; use metal framing anchors. Install fasteners through each fastener hole in metal framing anchor according to manufacturer's fastening schedules and written instructions.
- C. Securely connect each truss ply required for forming built-up girder trusses. Anchor trusses to girder trusses as indicated.
- D. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
- E. Retain subparagraph below if floor trusses are required.
- F. Install wood trusses within installation tolerances in TPI 1.
- G. Do not cut or remove truss members.
- H. Return wood trusses that are damaged or do not meet requirements to fabricator and replace with trusses that do meet requirements.

END OF SECTION 06176

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## SECTION 06185 - STRUCTURAL GLUED-LAMINATED TIMBER

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes glulam timber, engineered, stress-rated products assembled from selected and prepared wood laminations bonded together with adhesives with the grain of the laminations approximately parallel longitudinally.

#### 1.2 SUBMITTALS

- A. Product Data: For glulam timber and accessories.
- B. Shop Drawings: Include layout of structural glulam timber system and full dimensions of each member. Indicate laminating combination.
- C. Certificates of Conformance: Issued by a qualified testing and inspection agency indicating that glulam timbers comply with requirements in AITC A190.1.
- D. Wood-Treatment Certificates: Signed by wood treater certifying that treatment processes comply with requirements.

#### 1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide factory-glued structural units produced by an AITC-licensed firm.
  - 1. Factory mark each piece of structural glulam timber with AITC Quality Mark. Place mark on surfaces that will not be exposed in completed Work.
- B. Quality Standard: Comply with AITC A190.1, "Structural Glued Laminated Timber."

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with provisions in AITC 111, "Recommended Practice for Protection of Structural Glued Laminated Timber during Transit, Storage, and Erection."
- B. Individually wrap members with plastic-coated paper covering, with water-resistant seams.

### PART 2 - PRODUCTS

#### 2.1 STRUCTURAL GLULAM TIMBER FRAMING

- A. Species and Grades for Beams, Purlins, and Arches: Comply with AITC 117--MANUFACTURING requirements.
  - 1. Species and Combination Symbol: per General Structural Requirements.

- B. Appearance Grade: AITC 110, Industrial appearance grade.
- C. Preservative Treatment: Pressure treat lumber before gluing according to AWPAC28 for waterborne preservatives.
- D. Adhesive: Wet-use type complying with ASTM D 2559.
- E. End Sealer: Manufacturer's standard, transparent, colorless wood sealer that is effective in retarding the transmission of moisture at cross-grain cuts and is compatible with indicated finish.
- F. Penetrating Sealer: Manufacturer's standard, transparent, penetrating wood sealer that is compatible with indicated finish.
- G. Connectors, Anchors, and Accessories: Fabricate from structural-steel shapes, plates, and bars complying with ASTM A 36; steel bars complying with ASTM A 575, Grade M 1020; and hot-rolled steel sheet complying with ASTM A 570, Grade 33.
  - 1. Finish each assembly and fastener with rust-inhibitive primer, 2-mil dry film thickness  $< >$ .

## 2.2 FABRICATION

- A. Shop fabricate for connections to greatest extent possible, including cutting to length and drilling bolt holes.
- B. Camber: Fabricate horizontal and inclined members, units of less than 1:1 slope, with either circular or parabolic camber equal to 1/500 of span.
- C. End-Cut Sealing: Immediately after end-cutting each member to final length and after wood treatment (if any), apply a saturation coat of end sealer to ends and other cross-cut surfaces, keeping surfaces flood-coated for not less than 10 minutes.
- D. Seal Coat: After fabricating and sanding each unit, and end-coat sealing, apply a heavy saturation coat of penetrating sealer on surfaces of each unit, except for treated wood where treatment included a water repellent.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Erect structural glulam timber framing true and plumb, with uniform, close-fitting joints. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.
  - 1. Use padded slings and protect corners with wood blocking.
- B. Fit structural glulam timber framing by cutting and restoring exposed surfaces to match specified surfacing. Predrill for fasteners and assembly of units.
  - 1. Use connectors as templates for drilling bolt holes.
  - 2. Machine sand exposed surfaces to remove planing or surfacing marks, finishing with No. 120 grit sandpaper.
  - 3. Coat crosscuts with end sealer.

- C. Cutting: Avoid extra cutting after fabrication. Where field fitting is unavoidable, comply with requirements for shop fabrication.
  - 1. Where treated members must be cut during erection, apply a field-treatment preservative to comply with AWPA M4.
- D. Repair damaged surfaces and finishes after completing erection. Replace damaged structural glulam timber if repairs are not approved by Contracting Officer.
- E. Do not remove wrappings on individually wrapped members until they no longer serve a useful purpose, including protection from weather, soiling, and damage from work of other trades.

END OF SECTION 06185

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## SECTION 06200 - FINISH CARPENTRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Standing and running trim.
  - 2. Stairs and railings.
- B. See Division 6 Section "Exterior Architectural Woodwork" for exterior woodwork not specified in this Section.
- C. See Division 6 Section "Interior Architectural Woodwork" for interior woodwork not specified in this Section.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of factory-fabricated product and process indicated.
- B. Samples: For the following:
  - 1. Casework.
  - 2. Shelving.
  - 3. Plastic Laminate Finished Casework

### PART 2 - PRODUCTS

#### 2.1 MATERIALS, GENERAL

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," for lumber and with applicable grading rules of inspection agencies certified by the American Lumber Standards Committee Board of Review.
- B. Softwood Plywood: Comply with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood."
- C. Hardwood Plywood: Comply with HPVA HP-1, "Interim Voluntary Standard for Hardwood and Decorative Plywood."

#### 2.2 STANDING AND RUNNING TRIM

- A. Exterior Standing and Running Trim: Finished lumber and moldings.
  - 1. Species and Grade: Smooth-textured, Clear All Heart redwood; RIS Saw-textured, Clear Heart, western red cedar; NLGA, WCLIB, or WWPA.

- B. Primed Hardboard Trim: Fabricated from high-temperature-cured, high-resin, wood fiber composite; factory primed on face and two edges; and recommended by manufacturer for exterior use.
- C. Interior Standing and Running Trim: Finished lumber and moldings.
  - 1. Species and Grade or Cut: CSelect, eastern white pine; NELMA or B & Btr. Select or Supreme, Idaho white, ponderosa, or sugar pine; WWPA.
  - 2. Opaque Finish (Painted) P-grade primed medium-density fiberboard.
- D. Wood Molding Patterns: Stock moldings made to patterns included in WMMPA WM 7 and graded under WMMPA WM 4.
  - 1. Base: AWI Section 300, WM 356 9/16x3-1/4 trim.
  - 2. Casing: 11/16x2-1/4.
  - 3. Shoe Mold: Clear, kiln-dried red oak; WM 126, 1/2-by-3/4-inch quarter-round shoe.
  - 4. Moldings for Transparent Finish: N-Grade.
  - 5. Moldings for Painted Finish: P-Grade.
- E. Shelving: 3/4-inch particleboard shelving with radiused and filled front edge.

## 2.3 STAIRS AND RAILINGS

- A. Interior Stair Treads: 1-1/16-inch, clear, kiln-dried, edge-glued, rift-sawn red oak stepping with half-round nosing.

## 2.4 MISCELLANEOUS MATERIALS

- A. Fasteners for Exterior Finish Carpentry: Provide nails of stainless steel, hot-dip galvanized steel or non-corroding aluminum.

# PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Condition finish carpentry to average prevailing humidity conditions in installation areas before installation, for a minimum of 24 hours.
- B. Prime and backprime lumber for painted finish exposed on the exterior. Comply with requirements for surface preparation and application in Division 9 Section "Painting."

## 3.2 INSTALLATION

- A. Install finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where required for alignment. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts.
- B. Standing and Running Trim: Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Stagger joints in adjacent and related trim. Cope at returns and miter at corners.

- C. Repair damaged or defective finishes carpentry where possible to eliminate functional or visual defects. Where not possible to repair, replace finish carpentry. Adjust joinery for uniform appearance.

END OF SECTION 06200

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## SECTION 06401 - EXTERIOR ARCHITECTURAL WOODWORK

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Exterior standing and running trim.
  - 2. Exterior ornamental work.

#### 1.2 SUBMITTALS

- A. Product Data: For wood-preservative materials and finishes indicated.
- B. Shop Drawings: Include location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
- C. Samples: For each finish system and color, with one-half of exposed surface finished.

#### 1.3 QUALITY ASSURANCE

- A. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards." WIC's "Manual of Millwork."
  - 1. Provide AWI certification labels or compliance certificate WIC-certified compliance certificate.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Wood-Preservative-Treated Materials, Non-pressure Process: Treat woodwork items indicated to receive water-repellent preservative treatment to comply with AWPA N1 using the following preservative:
  - 1. Water-Repellent Preservative: Formulation containing 3-iodo-2-propynyl butyl carbamate (IPBC) complying with AWPA P8 as its active ingredient.
  - 2. Water-Repellent Preservative/Insecticide: Formulation containing 3-iodo-2-propynyl butyl carbamate (IPBC) as its active ingredient, combined with an insecticide containing chlorpyrifos as its active ingredient, both complying with AWPA P8.
- B. Nails: Hot-dip galvanized Stainless steel.
- C. Screws: Hot-dip galvanized Stainless steel.

#### 2.2 FABRICATION

- A. Wood Moisture Content: 9 to 15 percent.
- B. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

- C. Woodwork for Transparent Finish:
  - 1. Grade: Premium.
  - 2. Wood Species: All heart redwood and Western red cedar.
- D. Woodwork for Opaque Finish:
  - 1. Grade: Premium.
  - 2. Wood Species: All heart redwood and Western red cedar.
- E. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.
- F. Shop Priming: Shop prime woodwork for paint finish with one coat of wood primer specified in Division 9 Section "Painting."
  - 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to surfaces installed in contact with concrete or masonry and to end-grain surfaces.
- G. Shop Finishing: Comply with AWI Section 1500. To greatest extent possible, finish architectural woodwork at fabrication shop. Defer only final touchup and cleaning until after installation.
  - 1. Grade: Premium.
  - 2. Backpriming: Apply one coat of sealer or primer, compatible with finishes coats, to concealed surfaces of woodwork. Apply two coats to surfaces installed in contact with concrete or masonry and to end-grain surfaces.
  - 3. Finish System: AWI OP-4, conversion varnish, AWI OP-6 catalyzed polyurethane.
  - 4. Sheen: Satin 30-50, Semigloss 55-75 gloss units.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installation. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including backpriming and removal of packing.
- B. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified for type of woodwork involved.
- C. Install woodwork true and straight with no distortions. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
- D. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing. Use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork.
- F. Complete the finishing work specified to extent not completed at shop or before installation of woodwork. Fill nail and screw holes with matching filler where exposed.
- G. Refer to Division 9 Sections for final finishing of installed architectural woodwork.

- H. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06401

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## SECTION 06402 – INTERIOR ARCHITECTURAL WOODWORK

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes kitchen and vanity cabinets and countertops.

#### 1.2 SUBMITTALS

- A. Product Data: For cabinets, countertop material, and cabinet hardware.
- B. Shop Drawings: Include plans and elevations. Show materials, finishes, filler panels, hardware, countertop edge and backsplash profiles, cutouts for plumbing fixtures, and methods of joining countertops.
  - 1. Cabinets: Verify dimensions of installation areas by field measurements before fabrication and indicate measurements on Shop Drawings. Show fillers and scribes if necessary.
  - 2. Countertops: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.
- C. Samples: For each exposed finish.

#### 1.3 QUALITY ASSURANCE

- A. Quality Standards:
  - 1. Cabinets: KCMA A161.1.
    - a. KCMA Certification: Provide cabinets with KCMA's "Certified Cabinet" seal affixed in a semiexposed location of each unit and showing compliance with the above standard.
  - 2. Plastic-Laminate Countertops: KCMA A161.2.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, cabinets that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Wood-Mode, Inc., Kreamer, PA 717-374-2711 in cabinet styly meeting mininum component sizes and features specified herin.
  - 2. Haas Cabinet Co., Inc., Sellersburg, Indiana 812-246-4431; in cabinet style meeting minimum component sizes and features specified herein.
  - 3. Regency Oak, cabinet modified to match existing as specified herin.
  - 4. Or Approved Equal by Contracting Officer

#### 2.2 COLORS, TEXTURES, AND PATTERNS

- A. Colors, Textures, and Patterns: As selected by Contracting Officer from manufacturer's full range, unless otherwise indicated.

## 2.3 CABINET MATERIALS

### A. Exposed Materials:

- 1. Exposed Wood Species: Red oak. Do not use two adjacent exposed faces that are noticeably dissimilar in color, grain, figure, or natural character markings.
- 2. Solid Wood: Clear hardwood lumber of species indicated, free of defects, selected for compatible grain and color, and kiln dried to 7 percent moisture content.
- 3. Plywood: Hardwood plywood complying with HPVA HP-1 with face veneer of species indicated, selected for compatible color and grain with Grade A faces.

### B. Semiexposed Materials: Unless otherwise indicated, provide the following:

- 1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects and kiln dried to 7 percent moisture content. Stained to be compatible with exposed surfaces.
- 2. Plywood: Hardwood plywood complying with HPVA HP-1 with Grade C faces stained to be compatible with exposed surfaces.

### C. Concealed Materials:

- 1. Solid Wood or Plywood: Any hardwood or softwood species, with no defects affecting strength or utility. Hardwood and softwood lumber kiln dried to 7 and 10 percent moisture content, respectively.
- 2. Particleboard: ANSI A208.1, Grade M-2.
- 3. Medium-Density Fiberboard: ANSI A208.2.
- 4. Hardboard: AHA A135.4, Class 1 Tempered.

## 2.4 COUNTERTOP MATERIALS

### A. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.

- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Formica Corp.
  - b. Laminart.
  - c. Nevamar Corp.
  - d. Pioneer Plastics Corp.
  - e. Westinghouse Electric Corp.; Specialty Products Div.
  - f. Wilson, Ralph Plastics Co.
  - g. Or Approved Equal by Contracting Officer
- 2. Grade: HGP.
- 3. Color and Pattern: As selected by Contracting Officer from manufacturer's full range.

### B. Particleboard: ANSI A208.1, Grade M-2.

### C. Plywood: Exterior softwood plywood complying with PS 1, Grade C-C Plugged, touch sanded.

- D. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with material and performance requirements of ANSI Z124.3, Type 5 or Type 6, without a precoated finish.
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Retain subparagraph above for nonproprietary or subparagraph below for semiproprietary specification. Refer to Division 1 Section "Product Requirements."
    - b. Avonite, Inc.
    - c. DuPont Polymers.
    - d. Formica Corp.
    - e. Nevamar Corp.
    - f. Swan Corporation (The).
    - g. Wilson, Ralph Plastics Co.
    - h. Or Approved Equal by Contracting Officer.
  - 2. Color and Pattern: As selected by Contracting Officer from manufacturer's full range.

## 2.5 CASEWORK HARDWARE

- A. General: Complying with BHMA A156.9, of type, material, size, and finish as selected from manufacturer's standard choices.
- B. Drawer Guides: Epoxy-coated-metal, self-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05091.

## 2.6 CABINET CONSTRUCTION

- A. Face Style: Reveal overlay; door and drawer faces partially cover cabinet body or face frames .
- B. Face Frames: 3/4-by-1-5/8-inch solid wood .
- C. Door and Drawer Fronts: Solid-wood stiles and rails, 3/4 inch thick, with 1/4-inch- thick, veneer-faced plywood center panels .

## 2.7 PLASTIC-LAMINATE COUNTERTOPS

- A. Configuration: Fabricate countertops with the following front, cove (intersection of top with backsplash), backsplash, and end-splash style:
  - 1. Front: Countertop edges shall be edged with plastic laminate matching the countertop laminated. Edge band after post-forming is complete.
  - 2. Cove: Applied (backsplash rests on top forming seam at inside corner).
  - 3. Backsplash: Square edge.
  - 4. End Splash: Square edge.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install casework without variations in plane of adjoining surfaces; use concealed shims. Where casework abuts other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match casework face.
- B. Install casework and countertop level and plumb to a tolerance of 1/8 inch in 8 feet.
- C. Fasten cabinets to adjacent units and to backing.
  - 1. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches o.c.
- D. Fasten plastic-laminate countertops by screwing through corner blocks of base units into underside of countertop. Form seams using splines to align adjacent surfaces, and secure with glue and concealed clamping devices designed for this purpose.
- E. Fasten solid-surface countertops by screwing through corner blocks of base units into underside of countertop. Align adjacent surfaces, and form seams to comply with manufacturer's written instructions using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- F. Adjust casework and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

END OF SECTION 12356

## SECTION 07131 - SELF-ADHERING SHEET WATERPROOFING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes self-adhering, rubberized-asphalt sheet waterproofing.

#### 1.2 SUBMITTALS

- A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.
- B. Shop Drawings: Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
- C. Product test reports.

#### 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer, approved by manufacturer to install manufacturer's products.
- B. Preinstallation Conference: Conduct conference at Project site with Contracting Officer and Contractor.

#### 1.4 PROJECT CONDITIONS

- A. Environmental Conditions: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

#### 1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to replace waterproofing material that does not comply with requirements or that does not remain watertight for period of three years after date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 RUBBERIZED-ASPHALT SHEET WATERPROOFING

- A. Rubberized-Asphalt Sheet: 60-mil- thick, self-adhering sheet consisting of 56 mils of rubberized asphalt laminated to a 4-mil- thick, polyethylene film with release liner on adhesive side and formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
  - 2. Products: Subject to compliance with requirements, provide one of the following:
    - a. American Hydrotech, Inc.; VM 75.

- b. American Permaquik Inc.; PQ 7100.
- c. Carlisle Corporation, Carlisle Coatings & Waterproofing Div.; CCW 701.
- d. Cetco; Envirosheet.
- e. Grace, W. R. & Co.; Bituthene.
- f. Meadows, W. R., Inc.; Mel-Rol.
- g. T. C. Miradri; Miradri.
- h. Monsey Bakor; Elasto-Seal 2000.
- i. Pecora Corporation; Duramem 700-SM.
- j. Polyguard Products, Inc.; Polyguard 650.
- k. Progress Unlimited, Inc.; Plastiwrap 60.
- l. Tamko Roofing Products, Inc.; TW-60.

## 2.2 AUXILIARY MATERIALS

- A. Primer: Liquid waterborne primer recommended for substrate by manufacturer of sheet waterproofing material.
- B. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by manufacturer of sheet waterproofing material.
- C. Liquid Membrane: Elastomeric, two component, liquid, cold fluid applied, trowel grade or low viscosity.
- D. Substrate Patching Membrane: Low-viscosity, two-component, asphalt-modified coating.
- E. Mastic, Adhesives, and Tape: Liquid mastic and adhesives, and adhesive tapes recommended by waterproofing manufacturer.
- F. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch thick, predrilled at 9-inch centers.
- G. Protection Course: Semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between 2 asphalt-saturated fibrous liners and nominal thickness 1/4 inch.

## 2.3 MOLDED-SHEET DRAINAGE PANELS

- A. Molded-Sheet Drainage Panel: Comply with Division 2 Section "Subdrainage."
- B. Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel: Manufactured composite subsurface drainage panels consisting of a nonwoven, needle-punched geotextile facing with an apparent opening size not exceeding No. 70 sieve laminated to 1 side and a polymeric film bonded to the other side of a 3-dimensional, nonbiodegradable, molded-plastic-sheet drainage core, with a vertical flow rate of 9 to 15 gpm per ft..
- C. Woven-Geotextile-Faced, Molded-Sheet Drainage Panel: Manufactured composite subsurface drainage panels consisting of a woven-geotextile facing with an apparent opening size not exceeding No. 40 sieve laminated to 1 side of a 3-dimensional, nonbiodegradable, molded-plastic-sheet drainage core, with a horizontal flow rate not less than 2.8 gpm per ft..

## PART 3 - EXECUTION

### 3.1 SURFACE PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

- B. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
- C. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.
- D. Bridge and cover isolation joints, expansion joints and discontinuous deck-to-wall and deck-to-deck joints with overlapping sheet strips.
  - 1. Invert and loosely lay first sheet strip over center of joint. Firmly adhere second sheet strip to first and overlap to substrate.
- E. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.
- F. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

### 3.2 APPLICATION

- A. Install self-adhering sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.
- B. Apply primer to substrates at required rate and allow to dry.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- minimum lap widths and end laps. Overlap and seal seams and stagger end laps to ensure watertight installation.
- D. Apply continuous sheets over sheet strips bridging substrate cracks, construction, and contraction joints.
- E. Seal exposed edges of sheets at terminations not concealed by metal counterflashings or ending in reglets with mastic or sealant.
- F. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheets extending 6 inches beyond repaired areas in all directions.
- G. Correct deficiencies in or remove sheet waterproofing that does not comply with requirements, repair substrates, reapply waterproofing, and repair sheet flashings.
- H. Install protection course with butted joints over waterproofing membrane before starting subsequent construction operations.

### 3.3 MOLDED-SHEET DRAINAGE PANEL INSTALLATION

- A. Place and secure molded-sheet drainage panels according to manufacturer's written instructions. Use adhesives that do not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.

### 3.4 PROTECTION AND CLEANING

- A. Do not permit foot or vehicular traffic on unprotected horizontal membrane.

- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07131

## SECTION 07210 - BUILDING INSULATION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Insulation under slabs-on-grade.
  - 2. Cavity wall insulation.
  - 3. Concealed building insulation.
  - 4. Loose-fill building insulation.
  - 5. Vapor retarders.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Product test reports.
- C. Research/evaluation reports.

#### 1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84 for surface-burning characteristics, by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

### PART 2 - PRODUCTS

#### 2.1 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards and, for preformed units, in sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths, and lengths.
- B. Extruded-Polystyrene Board Insulation: ASTM C 578, Type IV, 1.60 lb/cu. ft., with maximum flame-spread and smoke-developed indices of 75 and 450, respectively.
- C. Molded-Polystyrene Board Insulation: ASTM C 578, Type I, 0.90 lb/cu. ft., with maximum flame-spread and smoke-developed indices of 75 and 450, respectively.
- D. Cellular Glass Insulation: ASTM C 552 Type I (flat block), with unfaced insulation passing ASTM E 136 for combustion characteristics.
- E. Glass-Fiber Board Insulation:
  - 1. Unfaced, Flexible Glass-Fiber Board Insulation: ASTM C 612, Type IA; ASTM C 553, Types I, II, and III; or ASTM C 665, Type I; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; and of the following properties
    - a. Nominal density of 1.0 lb/cu. ft., thermal resistivity of 3.7 deg F x h x sq. ft./Btu x in. at 75 deg F.

- b. Nominal density of not less than 1.5 lb/cu. ft. nor more than 1.7 lb/cu. ft., thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F.
      - c. Combustion Characteristics: Passes ASTM E 136.
    - 2. Unfaced, Glass-Fiber Board Insulation: ASTM C 612, Type IA or Types IA and IB; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; and of the following properties:
      - a. Nominal density of 2.25 lb/cu. ft., thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F.
      - b. Nominal density of 3 lb/cu. ft., thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F.
      - c. Nominal density of 4.25 lb/cu. ft., thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F.
      - d. Nominal density of 6 lb/cu. ft., thermal resistivity of 4.4 deg F x h x sq. ft./Btu x in. at 75 deg F.
  - F. Slag-Wool-/Rock-Wool-Fiber Board Insulation:
    - 1. Unfaced, Slag-Wool-/Rock-Wool-Fiber Board Insulation: ASTM C 612, maximum flame-spread and smoke-developed indices of 15 and 0, respectively; passing ASTM E 136 for combustion characteristics; and of the following density, type, thermal resistivity, and fiber color:
      - a. Nominal density of 4 lb/cu. ft., Types IA and IB, thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F.
      - b. Nominal density of 6 lb/cu. ft., Type II, thermal resistivity of 4.16 deg F x h x sq. ft./Btu x in. at 75 deg F.
      - c. Nominal density of 8 lb/cu. ft., Type III, thermal resistivity of 4.35 deg F x h x sq. ft./Btu x in. at 75 deg F.
      - d. Fiber Color: Regular color, unless otherwise indicated.
  - G. Mineral-fiber blanket insulation consisting of fibers manufactured from glass, slag wool, or rock wool:
    - 1. Unfaced Mineral-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
    - 2. Faced Mineral-Fiber Blanket Insulation: ASTM C 665, Type III, Class A; Category 1, faced with foil-scrim-kraft, foil-scrim, or foil-scrim-polyethylene vapor-retarder membrane on one face.
  - H. Cellulosic-Fiber Loose-Fill Insulation: ASTM C 739, chemically treated for flame-resistance, processing, and handling characteristics.
- 2.2 VAPOR RETARDERS
- A. Polyethylene Vapor Retarder: ASTM D 4397, 6 mils thick, with maximum permeance rating of 0.13 perm.
  - B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
- 2.3 AUXILIARY INSULATING MATERIALS

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.
- B. Asphalt Coating for Cellular Glass Block Insulation: Cutback asphalt or asphalt emulsion of type recommended by cellular glass block insulation manufacturer.
- C. Protection Board: Premolded, semirigid asphalt/fiber composition board, 1/4 inch thick, formed under heat and pressure, of standard sizes.
- D. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

## 2.4 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors with Washers: Plate formed from perforated galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square, welded to projecting steel spindle with a diameter of 0.105 inch and length capable of holding insulation of thickness indicated securely in position with 1-1/2- inch- square or diameter selflocking washers complying with the following:
  - 1. Washers formed from 0.016-inch- thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than in place.
  - 2. Where anchors are located in crawlspace attic spaces provide capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap.
- B. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain 1-inch air space between face of insulation and substrate to which anchor is attached.
- C. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Install insulation to comply with insulation manufacturer's written instructions applicable to products and application indicated. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- B. Install perimeter insulation on vertical surfaces by setting units in adhesive.
  - 1. If not otherwise indicated, extend insulation a minimum of 54 inches below exterior grade line.
  - 2. Protect below-grade insulation on vertical surfaces from damage during backfilling by applying protection board set in adhesive.
- C. Protect top surface of perimeter underlab insulation from damage during concrete work by applying protection board.
- D. Installation of General Building Insulation: Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated,

bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

1. Seal joints between closed-cell (non-breathing) insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant.
  2. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
  3. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:
    - a. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
    - b. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
  4. For wood-framed construction, install mineral-fiber blankets according to ASTM C 1320 and as follows:
    - a. With faced blankets having stapling flanges, secure insulation by inset, stapling flanges to sides of framing members.
    - b. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to produce airtight installation after concealing finish material is in place.
  5. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:
    - a. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions.
    - b. Apply insulation standoffs to each spindle to create cavity width indicated between concrete substrate and insulation.
    - c. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
    - d. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.
  6. Place loose-fill insulation into spaces and onto surfaces as shown, either by pouring or by machine blowing to comply with ASTM C 1015. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.
  7. For cellulosic loose-fill insulation, comply with the Cellulose Insulation Manufacturers Association's "Special Report #3, "Standard Practice for Installing Cellulose Insulation."
  8. Stuff glass-fiber, loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft..
- E. Installation of Vapor Retarders: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
1. Seal vertical joints in vapor retarders over framing by lapping not less than two wall studs. Fasten vapor retarders to framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches o.c.

2. Seal overlapping joints in vapor retarders with adhesives or vapor-retarder tape according to vapor-retarder manufacturer's instructions. Seal butt joints and fastener penetrations with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
3. Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor-retarder manufacturer.
4. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.
5. Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

END OF SECTION 07210

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## SECTION 07311 - ASPHALT SHINGLES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Asphalt shingles.
  - 2. Felt Underlayment.
  - 3. Self-adhering sheet Underlayment.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Samples: For asphalt shingles, ridge and hip cap shingles,.
- C. Product test reports.
- D. Research/evaluation reports.

#### 1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain ridge and hip cap shingles felt underlayment and self-adhering sheet underlayment through one source from a single asphalt shingle manufacturer.
- B. Fire-Test-Response Characteristics: Provide asphalt shingle and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
  - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated.
- C. Preinstallation Conference: Conduct conference at Project site.

#### 1.4 WARRANTY

- A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials within specified warranty period.
  - 1. Material Warranty Period: 25 years from date of Substantial Completion, prorated, with first 5 years non-prorated.
  - 2. The Contractor shall furnish a separate shingle manufacturer and contractor's warranty for the type of shingles specified. The manufacturer's warranty shall be full 5 year labor and material warranty for manufacturing defects. In addition to the manufacturer's warranty, the contractor shall cover a period of two years from the date of shingle acceptance by the Contracting Officer. Repair and replacement of defective work shall be done without cost to the Government. The Contractor's warranty shall provide the following:
    - a. If within that period the asphalt T-Lock shingles tear or blow off the roof in whole or in part because of winds of any velocity less than 75 miles per hour, replacement

of shingles, including both labor and materials, shall be the responsibility of the Contractor.

- b. All Tabbed shingles on general roof area, and around roof and vent flashing and eave and rake edges found to be free of adhesion during the 2 year warranty period shall be hand sealed at the responsibility of the Contractor.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
  - 2. Products: Subject to compliance with requirements, provide one of the products specified.

### 2.2 ORGANIC-FELT-REINFORCED ASPHALT SHINGLES

- A. Shingles: Shall be "Custom Lok 25" mineral surfaced lock tab asphalt (organic felt) shingle roofing in "Star White" color to match existing, as manufactured by Certain Teed Corporation or equal approved by the Contracting Officer. Shingles shall weigh no less than 250 pounds per square and bear a Class"C" fire rated label. Ridge shingles shall be job-fabricated from same shingles. ASTM D 225, Type III, laminated, multi-ply overlay construction, organic-felt reinforced, mineral-granule surfaced, and self-sealing; passing ASTM D 3161 for wind resistance.
- B. Hip and Ridge Shingles: Site-fabricated units cut from asphalt shingle strips. Trim each side of lapped portion of unit to taper approximately 1 inch.

### 2.3 UNDERLAYMENT MATERIALS

- A. Felts: ASTM D 226 or ASTM D 4869, Type II, asphalt-saturated organic felts, non-perforated.
- B. Self-Adhering Sheet Underlayment, Granular Surfaced: ASTM D 1970, minimum of 55-mil-thick sheet; glass-fiber-mat-reinforced, SBS-modified asphalt; mineral-granule surfaced; with release paper backing; cold applied.

### 2.4 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized steel wire shingle nails, minimum 0.120-inch- diameter, barbed shank, sharp-pointed, with a minimum 3/8-inch- diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through OSB or plywood sheathing.
  - 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- C. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized steel wire with low profile capped heads or disc caps, 1-inch minimum diameter.

### 2.5 METAL FLASHING AND TRIM

- A. Sheet Metal Flashing and Trim: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."
  - 1. Sheet Metal: Zinc-coated (galvanized) steel.
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item.

### PART 3 - EXECUTION

#### 3.1 UNDERLAYMENT INSTALLATION

- A. Double-Layer Felt Underlayment: Install double layers of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Install a 19-inch- wide starter course at eaves and completely cover with full-width second course. Install succeeding courses lapping previous courses 19 inches in shingle fashion. Lap ends a minimum of 6 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt underlayment nails.
  - 1. Install felt underlayment on roof sheathing not covered by self-adhering sheet underlayment. Lap edges over self-adhering sheet underlayment not less than 3 inches in direction to shed water.
- B. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated, lapped in direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.

#### 3.2 METAL FLASHING INSTALLATION

- A. General: Install metal flashing and other sheet metal to comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."
  - 1. Install metal flashing according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

#### 3.3 ASPHALT SHINGLE INSTALLATION

- A. Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."
- B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with tabs removed with self-sealing strip face up at roof edge.
  - 1. Extend asphalt shingles 1/2 inch over fascia at eaves and rakes.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with 6-inch offset pattern at succeeding courses, maintaining uniform exposure.
- D. Fasten asphalt shingle strips with a minimum of six roofing nails located according to manufacturer's written instructions.

- E. Closed-Cut Valleys: Extend asphalt shingle strips from one side of valley 12 inches beyond center of valley. Use one-piece shingle strips without joints in the valley. Fasten with extra nail in upper end of shingle. Install asphalt shingle courses from other side of valley and cut back to a straight line 2 inches short of valley centerline. Trim upper concealed corners of cut-back shingle strips.
1. Do not nail asphalt shingles within 6 inches of valley center.
  2. Set trimmed, concealed-corner asphalt shingles in a 3-inch- wide bed of asphalt roofing cement.
- F. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

The following Certificate of Guarantee must be signed at the completion of the project.

"Certificate of Guarantee"

We, (Name of Applicator Company), agree to maintain the roofing and flashing on the below mentioned building for the period indicated. This Agreement is to render the roof and flashing waterproof, subject to the conditions outline below.

Owner of Building \_\_\_\_\_  
Location \_\_\_\_\_

Location of Building \_\_\_\_\_ (Street Address)  
City \_\_\_\_\_  
State \_\_\_\_\_

Number of square feet in roof \_\_\_\_\_

This Guarantee is effective this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.  
The manufacturer's warranty is five years labor and material for manufacturing defects and a 25-year limited warranty. It is understood and agreed that we will not be responsible for leaks in the roofing or flashing due to excessive winds, distortion of the foundation on which the roofing or flashing rests, excessive hail storms, or any other conditions over which we have no control.

Signed

\_\_\_\_\_(Name of Applicator Company)\_\_\_\_\_

By

\_\_\_\_\_(Signature and Title)\_\_\_\_\_

END OF SECTION 07311

## SECTION 07460 – SIDING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Steel 8" lap siding, soffit, fascia and flashing to match existing.

#### 1.2 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of product specified, including details of construction relative to materials, dimensions of individual components, profiles, textures, and colors.

#### 1.3 QUALITY ASSURANCE

- A. Single-Source Responsibility of Siding and Accessories: Obtain each color, grade, finish, type, and variety of siding and related accessories from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- B. Install all components to comply with manufacturer's instructions for wind design condition at project site.

#### 1.4 EXTRA MATERIALS

- A. Deliver extra materials to Contracting Officer. Furnish two percent extra materials matching products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.

#### 1.5 WARRANTY

- A. Warranties: Manufacturer's standard lifetime warranty.
  - 1. Nonprorated warranty against defects which may result in rusting, splitting, chipping, peeling, flaking, crazing, blistering, premature chalking and fading. Warranty shall include labor and material.
  - 2. Warranties shall be submitted with request for payment.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer: Match existing. Where existing product cannot be matched, provide products from one of the following.

1. Siding:
  - a. Alcan, Division of Gentek Building Products, Inc.; Sequoia Pattern
  - b. Alside, Inc.; Satinwood
  - c. Or Equal
2. Accessories:
  - a. Manufacturer standard by siding manufacturer.
3. Sealant:
  - a. Polyurethane: Federal Spec TT-S-230C

## 2.2 MATERIALS

- A. Formed Steel Siding: Roll formed from G-90 Galvanized steel complying with ASTM A361/525 SBCCI 9182, ICBO #2027/2457.
- B. Provide siding, soffit, fascia, trim and other components from one manufacturer only.
  1. Alcan Sequoia or Alside Satinwood or Equal
    - a. Exposure: 8 inch interlocking lap.
    - b. 29 gage roll formed.
    - c. Texture: Wood grained.
    - d. Finish: Manufacturer PVC coating meeting ASTM D-1186 3.5 mils dry film thickness, with corrosion protective chemical treatment.
    - e. Color: See color schedule for color.
    - f. Limited lifetime warranty per manufacturer.
  2. Aluminum Soffit:
    - a. Soffit shall be nominal 0.019 inch thick aluminum.
    - b. Soffit shall be V-groove style, 16 inches wide with tongue and groove engagement.
    - c. Soffit shall be factory-finished after forming with poly-vinyl chloride based enamel.
    - d. All edges shall be coated, including lanced protrusions formed on aerated panels.
  3. Steel Fascia:
    - a. Fascia shall be nominal 0.0172 inch thick (29-guage) galvanized steel.
    - b. Fascia shall be factory finished with poly-vinyl chloride based enamel, color matched to the soffit.
    - c. Fascia shall be textured.
  4. Steel Coil Stock:
    - a. Coil Stock shall be nominal 0.0172 inch thick (29-guage) galvanized steel.
    - b. Coil shall be color matched to the siding soffit and fascia system.
    - c. Coil shall be factory-finished with the manufactures standard paint finish.
- C. Provide siding, soffit, fascia, trim and other components from on manufacturer only.

## 2.3 DISCONTINUED COLORS

- A. Some colors are no longer available and are unmatchable for remodels. Salvage for re-installation on other units of like colors. Install entirely new siding with colors acceptable to the contracting officer.

## 2.4 ACCESSORIES

- A. Siding Accessories: Continuous ventilating soffit panels, individual corners, door casings, window casings, starter strips, trim, coil stock for wrapping and other items as recommended by manufacturer for building configuration, matching type of siding selected.
  1. Soffit Panels: Install perpendicular to wall and fascia panel.

2. Coil Stock: Steel PVC striated, .016" thick 18 inch x 50 ft. rolls for wrapping miscellaneous wood trim at window openings, exterior columns and as indicated on drawings. Color shall match siding color.
  3. All "J" channel casings shall be overlapped per manufacturer recommendations.
- B. Fasteners: Noncorrosive aluminum siding nails, in sufficient length to penetrate minimum of 1 inch into substrate. Provide prefinished fasteners in color to match siding where face nailing is unavoidable. Provide fasteners conforming to FF-N-105B or as approved by manufacturer for warranty.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Comply with siding manufacturer's installation instructions and recommendations. Center nails in elongated nailing slots without binding siding to allow for thermal movement. Install trim and accessories in accordance with manufacturer's recommendations. Overlap butt joints to shed water away from direction of prevailing wind. Isolate dissimilar metals. Stained, discolored, or damaged materials shall be removed from base and be replaced with new materials of equal value at not cost to the government.
1. Each typical building shall be completed as a prototype for approval by the Contracting Officer and other buildings will be started upon approval from Contracting Officer and if timely completion can be anticipated.

#### 3.2 WALL PREPARATION AND INSTALLATION

- A. Existing surface preparation for existing units shall be done in accordance with the following:
1. Remove and salvage existing yellow colored siding (light and dark), and green colored siding. Store to be reinstalled with complete accessories.
  2. Remove and salvage existing siding complete as for units with new siding.
  3. Apply new siding to entire surfaces, corner to corner. Where additional siding is required on an existing surface, match color from salvaged siding to complete the surface.
  4. At all areas of removed siding, include removal of insulation backing.
  5. Inspect for rotted substrate conditions. Remove and replace any and all rotted substrate conditions.
  6. Apply housewrap over existing and new sheathing. Double wrap all corners.
  7. Install "J" channel molding in sealant bed around all door, window vent, electrical and hosebib blockouts. No exceptions.
    - a. Hosebib, vent and electrical blocks per details.
  8. Install manufacturer steel starter strips full length as required.
  9. Install all furring and accessories required for proper base for siding.
  10. Install preformed lapped insulation board. Nail to substrate - "stratawall" or equal.
  11. Install siding with nails per manufacturer recommendations to allow for expansion and contraction of each panel.
  12. Provide uniform joint pattern. End joints shall be staggered and separated by at least two horizontal courses.
  13. Filed edges: Shear cut method only.
  14. Paint touch up with manufacturer recommended paint.

#### 3.3 GROUNDING

- A. Grounding: Steel siding and accessories shall be grounded. Ground wire shall be connected to UL listed connector. Ground shall be cold water service lines or electrical ground stakes or rods. Stakes or rods shall comply with NEC. Two stakes shall be used and installed on opposite sides of each building. Depth of rods, eight feet.

END OF SECTION 07460

## SECTION 07620 – FLASHING AND SHEET METAL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract apply to work of this section.

#### 1.2 SUMMARY:

- A. The types of work specified in this section include the following:
  - 1. Metal counter flashing
  - 2. Metal wall flashing and expansion joints
  - 3. Miscellaneous sheet metal accessories
  - 4. Roofing accessories are specified in roofing system sections as roofing work.

#### 1.3 SUBMITTALS:

- A. Product Data: Flashing, Sheet Metal, Accessories: Submit manufacturer's product specifications, installation instructions and general recommendations for each specified sheet material and fabricated product.

#### 1.4 JOB CONDITIONS:

- A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of the work and protection of materials and finishes.

### PART 2 - PRODUCTS

#### 2.1 FLASHING AND SHEET METAL MATERIALS:

- A. Sheet Metal Flashing/Trim: (One of the following)
  - 1. Aluminum: ASTM B-209, alloy 3003, temper H14, AA-C22A41 clear anodized finish; 0.032" thick (20 gage) except as otherwise indicated. Color from manufacturer's standard 20-year color.
  - 2. Steel zinc coated sheet ASTM A446 with G 90 zinc coating, 26 gage except as otherwise indicated. Baked on 20 year color to be selected from manufacturer's standard.
- B. Miscellaneous Materials and Accessories:
  - 1. Fasteners: Same metal as flashing/sheet metal or, other noncorrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.
  - 2. Bituminous Coating: FS TT-C0494 or SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.
  - 3. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

4. Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed; comply with DOW 790.
  5. Epoxy Seam Sealer: 2-part noncorrosive metal seam cementing compound, recommended by manufacturer for exterior/interior nonmoving joints including riveted joints.
  6. Adhesives: Type recommended by flashing sheet manufacturer for waterproof/weather-resistant seaming and adhesive application of flashing sheet.
  7. Metal Accessories: Provide sheet metal clips, starts, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gage required for performance.
  8. Elastic Flashing Filler: Closed-cell polyethylene or other soft-closed-cell material recommended by elastic flashing manufacturer as filler under flashing loops to ensure movement with minimum stress on flashing sheet.
  9. Roofing Cement: ASTM D-2822, asphaltic.
- C. Gutter and Downspouts:
1. Alcoa "System Six" prefinished, factory fabricated 6 inch ogee gutters 0.032 inch (0.813 gauge) aluminum and 3 inch by 4 inch rectangular corrugated downspouts 0.027 inch (0.686 gauge) aluminum.
  2. Aluminum: Alcoa Aluminum Sheet, 3105-H26 or equivalent with AlumaLure 2000 finish.
  3. Finish: Alcoa two-coat acrylic coating, consisting of a baked on corrosion-inhibiting primer and baked-on high performance acrylic topcoat. Colors as scheduled or noted on drawings.
  4. Gutter Trim and Accessories: Provide trim and accessory materials of same manufacturer as gutters and downspout; and of same material and finish as aluminum gutter and downspout.
    - a. Strap hangers: OG141 type, 0.082 inch gauge.
    - b. End Caps: 0.024 inch.
    - c. Inside/Outside Miters: 0.032 inch.
    - d. Sealant: Alcoa Gutterseal.
    - e. Downspout Clip: 0.124 inch.
    - f. Expansion Joint: Aluminum lined with neoprene.
    - g. Leaf Strainer: RT224.

## 2.2 FABRICATED UNITS:

- A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels and indicated, with exposed edges folded back to form hems.
- B. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seals with epoxy seam sealer; rivet joints for additional strength where required.
- C. Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproofed, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant (concealed within joints) and provide joints covers extending 4" minimum each side of joint.

- D. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with industry standards and provide joint covers.
- E. Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION REQUIREMENTS:

- A. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.
- B. Underlayment: Where stainless steel or aluminum is to be installed directly on cementitious or wood substrates, install a course of paper slip sheet and a course of polyethylene underlayment.
- C. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.
  - 1. Install counterflashing in reglets, either by snap-in seal arrangement, or by wedging in place for anchorage and filling reglet with mastic or elastomeric sealant, as indicated and depending on degree of sealant exposure.
- D. Install elastic flashing without stretching. Install elastic flashing filler strips to provide for movement by forming loops or bellows in width of flashing. Locate filler strips to facilitate complete drainage of water from flashing. Seam flashing sheets with adhesive, and anchor edges in manner indicated.
- E. Nail flanges of expansion joint units to curb nailers, at maximum spacing of 6". Complete seams at joints between units, to form a continuous waterproof system.
- F. Fabricate, support and anchor gutters and downspouts in a manner which will withstand thermal expansion, stresses and full loading by ice or water without damage, deterioration or leakage. Extend downspouts to outlets indicated.

#### 3.2 CLEANING AND PROTECTION:

- A. Clean exposed metal surfaces removing substances which might cause corrosion of metal or deterioration of finishes.
- B. Protection: Installer shall advise contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.

END OF SECTION 07600

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## SECTION 07841 - THROUGH-PENETRATION FIRESTOP SYSTEMS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes through-penetration firestop systems for the following types of fire-resistance-rated assemblies:
  - 1. Floors.
  - 2. Roofs.
  - 3. Walls and partitions.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. F-Ratings: Provide firestop systems with F-ratings equaling or exceeding fire-resistance rating of constructions penetrated as determined per ASTM E 814.
- B. T-Ratings: Provide firestop systems with T-ratings required, as well as F-ratings, determined per ASTM E 814, where systems protect penetrating items with potential to contact adjacent materials in occupiable floor areas including, but not limited, to the following:
  - 1. Penetrations located outside wall cavities.
  - 2. Penetrations located outside fire-resistive shaft enclosures.
  - 3. Penetrations located in construction containing fire-protection-rated openings.
  - 4. Penetrating items larger than 4-inch- diameter nominal pipe or 16sq. in. in overall cross-sectional area.
- C. For firestop systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
  - 1. For piping penetrations for plumbing provide moisture-resistant firestop systems.
  - 2. For penetrations involving insulated piping, provide firestop systems not requiring removal of insulation.
- D. For through-penetration firestop systems exposed to view, provide products with flame-spread indices of less than 25 and smoke-developed indices of less than 450, when tested per ASTM E 84.

#### 1.3 SUBMITTALS

- A. Product Data: For each product indicated.

- 1.4 Shop Drawings: Include details of installation and design designation of testing and inspecting agency acceptable to authorities having jurisdiction that evidences compliance with requirements for each condition indicated.

#### 1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide rated systems identical to those tested per ASTM E 814 and with products bearing the classification marking of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.

- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate firestop systems.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, those indicated in the Through Penetration Firestop System Schedule at the end of Part 3.

### 2.2 FIRESTOP SYSTEMS

- A. Compatibility: Provide firestop systems that are compatible with the substrates forming openings, and with the items, if any, penetrating firestop systems, under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Accessories: Provide accessories required to install fill materials that comply with requirements of tested assemblies, are approved by qualified testing and inspecting agency that performed testing, and are specified by manufacturer of tested assemblies. Accessories include, but are not limited to, the following:
  - 1. Permanent forming/damming/backing materials.
    - a. Slag-/rock-wool-fiber insulation.
    - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    - c. Fire-rated form board.
    - d. Fillers for sealants.
  - 2. Temporary forming materials.
  - 3. Substrate primers.
  - 4. Collars.
  - 5. Steel sleeves.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Install through-penetration firestop systems to comply with "Performance Requirements" Article and firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Clean openings immediately before installing firestop systems.
  - 1. Remove foreign materials that could interfere with adhesion of firestop systems.
  - 2. Remove laitance and form-release agents from concrete.
  - 3. Produce clean, sound surfaces capable of developing optimum bond with firestop systems. Remove loose particles remaining from cleaning operation.
- C. Priming: Prime substrates when recommended in writing by firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not spill primers or allow them to migrate onto adjoining surfaces.

- D. Masking Tape: Use masking tape where required to prevent contact of firestopping with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove firestopping smears. Remove tape immediately after installation without disturbing firestopping seal.
- E. Accessories: Install accessories of types required to support fill materials during their application and in the position necessary to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
  - 1. After installing fill materials, remove combustible forming materials and other accessories that are not permanent components of firestop systems.
- F. Install fill materials for firestop systems by proven techniques.
  - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
  - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
  - 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
- G. Identification: Identify firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible. Include the following information on labels:
  - 1. The words: "Warning--Through-Penetration Firestop System--Do Not Disturb. Notify Building Management of Any Damage."
  - 2. Contractor's name, address, and phone number.
  - 3. Through-penetration firestop system designation of applicable testing and inspecting agency.
  - 4. Date of installation.
  - 5. Firestop system manufacturer's name.
  - 6. Installer's name.
- H. Clean excess fill materials adjacent to openings as installation progresses by methods and with cleaning materials that are approved in writing by manufacturers and that do not damage materials in which openings occur.

### 3.2 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE

- A. Where UL-classified systems are indicated, they refer to the alpha-alpha-numeric designations listed in UL's "Fire Resistance Directory" under product Category XHEZ.
- B. Firestop Systems for Metallic Pipes, Conduit, or Tubing FS-1: Comply with the following:
  - 1. UL-Classified Systems: FC 1010, FC 1013, FC 1014, WL 1062, WL 1049, WL 1093
- C. Firestop Systems for Nonmetallic Pipe, Conduit, or Tubing FS-1: Comply with the following:
  - 1. UL-Classified Systems: FC 2035, FC 2022, WL 2059, WL 2074
- D. Firestop Systems for Electrical Cables FS-1: Comply with the following:
  - 1. UL-Classified Systems: FC 3013, FC 3015, WL 3024, WL 3025, WL 3076, WL 3024

- E. Firestop Systems for Cable Trays FS-1: Comply with the following:
  - 1. UL-Classified Systems: W-L-4008, W-L-4005
- F. Firestop Systems for Insulated Pipes FS-1: Comply with the following:
  - 1. UL-Classified Systems: F-C-5014, W-L-5051, W-L-5054
- G. Firestop Systems for Miscellaneous Electrical Penetrants FS-1: Comply with the following:
  - 1. UL-Classified Systems: UL Listed and Tested Putty Pads For Back Boxes WL-6001
- H. Firestop Systems for Miscellaneous Mechanical Penetrations FS-1: Comply with the following:
  - 1. UL-Classified Systems: F-C-7002, W-L-7009
- I. Firestop Systems for Groupings of Penetrations FS-1: Comply with the following:
  - 1. UL-Classified Systems: W-L-8003, F-C-8004, F-C-8001, F-C-8010, F-C-8011

END OF SECTION 07841

## SECTION 07920 – CAULKING AND SEALANTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract apply to work of this section.

#### 1.2 SUMMARY:

- A. Provide sealants at joints and recesses in exterior and interior construction to prevent infiltration of water, moisture, or wind, and sound or light passage through such joints and recesses and as required to provide first class painters job.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS:

- A. Sealant: Dow #790, General Electric Silicone Sealant; Pecora BC-158 butyl, PTI 757 butyl, Sonneborn Butakauk; Sonneborn Sololastic NP2, Pecora Dynatrol II, or equals. Standard colors selected by Project Representative.
- B. Joint Filler (7/8" maximum width):
  - 1. Closed-cell foamed butyl or polyethylene rod: PRC "89" preformed joint filler, Dow "Ethafoam", PRC "Mincel" backer rods.
  - 2. For joints exceeding 7/8" closed cell sponge of vinyl or rubber of medium density open celled sponge of vinyl or polyethylene tape bondbreaker on top.
  - 3. Do not use asphalt saturated filler.
- C. Silicone Sealant: Interior use.
  - 1. Silicone Emulsion Sealant: Provide product complying with ASTM C 834 and, except for weight loss measured per ASTM C 792, with ASTM C 920 that accommodates joint movement of not more than 25 percent in both extension and compression for a total of 50 percent.
  - 2. Products: Subject to compliance with requirements, provide one of the following:
    - a. Silicone-Emulsion Sealant:
      - 1) "Trade Mate Paintable Glazing Sealant," Dow Corning Corp.
      - 2) "General Electric" Silicone Sealant
      - 3) Or Equal
- D. Butyl Sealants: Roofing Use Only.
  - 1. Butyl Sealant: Manufacturer's standard nonsag, paintable, butyl sealant complying with the following requirements: U.S. TT-S-001657, Type I.
  - 2. Products: Subject to compliance with requirements, provide one of the following:
    - a. Butyl Sealant:
      - 1) "TREMCO" Butyl Sealant
      - 2) "OSI" -SBR 100
      - 3) "BOSTICK" Chemical 300
      - 4) "PECORA BC-158 Butyl
      - 5) "PTI" 757 Butyl

6) Or Equal

- E. Polyurethane Sealants: Exterior use.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Dymeric 511 by Tremco
    - b. Dymonic by Tremco
    - c. Sonolastic by Sonneborn Co.
    - d. Or Equal
  - 2. Specifications: ASTM C-920, Type M, Grade NS, Class 25, TT-S-022 7E, Type II, Class A, 19-GP-24
- F. Primers: As recommended by manufacturer of caulking and sealant materials.

PART 3 - PROCEDURES

3.1 PREPARATION

- A. Prime joints both sides to full depth of sealant as required by manufacturer.
- B. Fill large, deep joints with backing rod to proper depth for sealant shape.
- C. Apply masking tape both sides of exposed joints.

3.2 INSTALLATION

- A. Apply sealant with gun or hand tool using nozzle of proper size for joints. Make beads at least 1/4" x 3/8" but not less than manufacturer's recommended sizes.
- B. Point up exposed joints neatly by striking with tool or finger; do not allow ragged edges, runs, spatters.
- C. Remove all masking tape. Clean caulking from adjacent surfaces.

END OF SECTION 07920

## SECTION 08110 – METAL CLAD DOORS AND FRAMES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes steel doors and frames.
  - 1. Clad building unit entry doors and corresponding frames.
  - 2. Storm doors.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated. Include door designation, type, level and model, material description, label compliance, fire-resistance ratings, and finishes.
- B. Door Schedule. Use same reference designations indicated on Drawings.

#### 1.3 QUALITY ASSURANCE

- A. Steel Door and Frame Standard: Comply with ANSI A 250.8, unless more stringent requirements are indicated.
- B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- 1. Weather Shield Mfg. Inc.
- 2. Pella Corporation.
- 3. Or Equal

#### 2.2 MATERIALS

- A. Hot-Rolled Steel Sheets: ASTM A 569/A 569M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Cold-Rolled Steel Sheets: ASTM A 366/A 366M, Commercial Steel (CS), or ASTM A 620/A 620M, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness.

#### 2.3 DOORS

- A. Exterior Doors: Complying with ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level indicated.
  - 1. Level 3 and Physical Performance Level A, Model 3 (Stile and Rail).

#### 2.4 FRAMES

- A. General: ANSI A250.8; conceal fastenings, unless otherwise indicated.

B. Frame Steel Sheet Thickness:

1. Clad Frames: Milled from Western Pine, kiln dried to a moisture content of 6 to 12% at time of fabrication and treated with a water repellent preservative. Frame thickness of 1-1/8 inch at head and side jambs. Mill finished aluminum sill with vinyl thermal break and treated pine sill filler. Exterior frame surfaces are clad with extruded aluminum of 0.050 thickness with integral installation fin. Standard jamb depth of 4-9/16 inch. Furnish units with factory-applied extension jamb for installation in wall assembly thickness. Provide manufacturer's "Artic White" clad finish on all doors

C. Door Silencers: Three silencers on single-door frames and two silencers on double-door frames.

D. Plaster Guards: 0.016-inch- thick, steel sheet plaster guards or mortar boxes to close off interior of openings.

E. Supports and Anchors: Not less than 0.042-inch- thick zinc-coated steel sheet.

F. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Zinc-coat items that are to be built into exterior walls according to ASTM A 153/A 153M, Class C or D as applicable.

## 2.5 FABRICATION

A. General: Fabricate steel door and frame units to comply with ANSI A250.8 free from defects including warp and buckle. Where practical, fit and assemble units in manufacturer's plant.

B. Exterior Doors: Fabricate doors, panels, and frames from metallic-coated steel sheet. Close top and bottom edges of doors flush as an integral part of door construction or by addition of 0.053-inch- thick, metallic-coated steel channels with channel webs placed even with top and bottom edges.

C. Interior Door and Panel Faces: Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from cold-rolled steel sheet.

D. Core Construction: Manufacturer's standard core construction that produces a door complying with SDI standards.

E. Clearances for Non-Fire-Rated Doors: Not more than 1/8 inch at jambs and heads, except not more than 1/4 inch between pairs of doors. Not more than 3/4 inch at bottom.

F. Clearances for Fire-Rated Doors: As required by NFPA 80.

G. Door-Edge Profile: Square edge, unless beveled edge is indicated.

H. Tolerances: Comply with SDI 117.

I. Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements in ANSI A250.6 and ANSI A115 Series specifications for door and frame preparation for hardware.

J. Frame Construction:

1. Fabricate frames with mitered or coped and continuously welded corners and seamless face joints. Provide temporary spreader bars.
  2. Fabricate knock-down frames with mitered or coped corners, for field assembly.
  3. Fabricate knock-down, drywall slip-on frames for in-place gypsum board partitions.
  4. Provide terminated stops.
- K. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- L. Locate hardware as indicated or, if not indicated, according to ANSI A250.8.
- M. Glazing Stops: Manufacturer's standard, formed from 0.032-inch- thick steel sheet.
1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
  2. Provide screw-applied, removable, glazing stops on inside of glass, louvers, and other panels in doors.
- N. Astragals: As required by NFPA 80 to provide fire ratings indicated.

## 2.6 FINISHES

- A. Prime Finish: Manufacturer's standard, factory-applied coat of rust-inhibiting primer complying with ANSI A250.10 for acceptance criteria.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Placing Frames: Comply with provisions in SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
1. Wall Anchors: Provide at least three anchors per jamb. For openings 90 inches or more in height, install an additional anchor at hinge and strike jambs.
  2. Gypsum Board Partitions: For in-place partitions, install knock-down, drywall slip-on frames.
  3. Fire-Rated Frames: Install according to NFPA 80.
- B. Door Installation: Comply with ANSI A250.8. Shim as necessary to comply with SDI 122 and ANSI/DHI A115.1G.
1. Fire-Rated Doors: Install within clearances specified in NFPA 80.
- C. After installation, remove protective wrappings from doors and frames and touch up prime coat with compatible air-drying primer.

END OF SECTION 08110

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## SECTION 08211 - WOOD DOORS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes solid- and hollow-core doors as follows:
  - 1. Doors with hardboard faces.
  - 2. Factory fitting wood doors to frames and factory machining for hardware.
- B. See Division 6 Section " Interior Architectural Woodwork" for wood door frames.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of door. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details; location and extent of hardware blocking; mortises, holes, and cutouts; requirements for veneer matching; factory finishing; fire ratings; and other pertinent data.
- C. Samples: For each face material and finish.

#### 1.3 QUALITY ASSURANCE

- A. Quality Standard: Comply with NWWDA I.S.1-A, "Architectural Wood Flush Doors."

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Interior Panel Doors:
    - a. Interior prefit door units, 1-3/4 inch thick, 6'-8" high by width required in door schedule.
    - b. Construction: Wood stile and rail with molded hardboard hollow core panels, smooth, pre-primed, Colonist six panel design as manufactured by Premdo, Simpson or equal.
    - c. Adhesive: Type 1, waterproof.
  - 2. Interior Bi-Folding Doors:
    - a. Interior prefit door units, 1-3/4 inch thick, 6'-8" high by width required in door schedule.
    - b. Design and Layout: Panel design as described below under NWWDA design group, with minimum dimensions for stiles, rails, panels, and other elements complying with referenced NWWDA standard.
  - 3. Frames:
    - a. Two piece wood, grading for opaque finish, assembled with door for pre-hung installation of single leaf hinged doors.

#### 2.2 FABRICATION

- A. Fabricate doors in sizes indicated for Project-site fitting.
- B. Exterior Doors: Flash top of outswinging doors (with manufacturer's standard metal flashing).

2.3 FACTORY FINISHING

- A. General: Field finish doors indicated to receive opaque finish.
- B. Finish: AWI System TR-6 catalyzed polyurethane.
- C. Effect: Open-grain finish.
- D. Sheen: Satin.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
- B. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- C. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION 08211

## SECTION 08361 - SECTIONAL OVERHEAD DOORS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes steel sectional overhead doors.
- B. See Division 8 Section "Door Hardware" for lock cylinders and keying.
- C. Division 16 Sections for electrical service, connections, disconnects, and circuit breakers for powered operators, and accessories.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide doors capable of withstanding the effects of gravity loads and the following loads and stresses without evidencing permanent deformation of components:
  - 1. Wind Load: Uniform pressure (velocity pressure) of 20 lbf/sq. ft., acting inward and outward.
  - 2. Operational Life: Design components to operate for not less than 25,000 cycles.
    - a. Operation Cycle: One complete cycle begins with door in closed position. Door is then moved to open position and back to closed position.

#### 1.3 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details of installation, and attachments to other Work.
  - 1. Verify openings by field measurements before fabrication and indicate measurements on Shop Drawings.
- C. Samples: For each exposed finish.

#### 1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Crawford Door Co. Div., Jim Walters Doors
  - 2. Overhead Door Corp.
  - 3. Raynor Mfg. Co.
  - 4. Or approved Equal

## 2.2 STEEL DOOR SECTIONS

- A. General: Fabricated from galvanized, structural-quality commercial steel with minimum yield strength of 33,000 psi and complying with ASTM A 653/A 653M, G90 zinc coating.
  - 1. Steel Sheet Thickness: 0.028 inch.
  - 2. Exterior Section Face: Textured Wood Grain Raised Panel.
- B. Door Panels: Fabricated from a single sheet with sections not more than 24 inches high and nominally 2 inches deep. Roll horizontal meeting edges to a continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove weathertight seal, with a reinforcing flange return.
  - 1. Insulated Doors: With continuous thermal-break construction separating faces of door.
- C. Door Sections: Enclose open section with not less than 0.064-inch galvanized steel channel end stiles welded in place. Fabricate with not less than 0.064-inch galvanized intermediate stiles, cut to door section profile, spaced at not more than 48 inches o.c., and welded in place.
  - 1. Reinforce bottom section with a continuous channel or angle complying with bottom section profile.
  - 2. Reinforce sections with continuous horizontal and diagonal reinforcement of galvanized steel bars, struts, trusses or strip steel, formed to depth and bolted or welded in place.
  - 3. Reinforce for hardware attachment.
  - 4. Insulation: Insulate inner core of steel sections with rigid cellular polystyrene or polyurethane thermal insulation, with maximum flame-spread and smoke-developed indices of 75 and 450, respectively, according to ASTM E 84; or with fiberglass thermal insulation. Enclose insulation completely, with no exposed insulation material evident.
- D. Fabricate sections so finished door assembly is rigid and aligned, with tight hairline joints, and free of warp, twist, and deformation.
- E. Finish: Manufacturer's standard thermosetting finish.
  - 1. Color and Gloss: Pre-finished doors, including primer and two coats of paint to match color of siding .

## 2.3 TRACKS, SUPPORTS, AND ACCESSORIES

- A. Tracks: Galvanized steel track system complying with ASTM A 653/A 653M, G60 zinc coating, sized for door size and weight, designed for lift type indicated.
  - 1. Provide complete track assembly including brackets, bracing, and reinforcement for rigid support of ball-bearing roller guides for required door type and size.
  - 2. Slot vertical sections of track at 2 inches o.c. for door-drop safety device.
  - 3. Slope tracks at proper angle from vertical or otherwise design to ensure tight closure at jambs when door unit is closed.
  - 4. Weld or bolt to track supports.
- B. Track Reinforcement and Supports: Galvanized steel and support members, complying with ASTM A 36/A 36M and ASTM A 123. Secure, reinforce, and support tracks as required for door size and weight to provide strength and rigidity without sag, sway, and vibration during opening and closing of doors.

- C. Support and attach tracks to opening jambs with continuous angle welded to tracks and attached to wall. Support horizontal (ceiling) tracks with continuous angle welded to track and supported by laterally braced attachments to overhead structural members at curve and end of tracks.
- D. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom and at top of overhead door.
  - 1. Motor-Operated Doors: With combination bottom weatherseal and sensor edge.
  - 2. Jamb Seals: Continuous flexible seals at door jambs for weathertight installation.

## 2.4 HARDWARE

- A. General: Heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless-steel, or other corrosion-resistant fasteners, to suit door type.
- B. Hinges: Heavy-duty galvanized steel hinges, of not less than 0.0747-inch- thick uncoated steel, at each end stile and at each intermediate stile, per manufacturer's written recommendations for door size.
  - 1. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is not possible.
  - 2. Use double-end hinges, where required, for doors exceeding 16 feet in width, unless otherwise recommended by door manufacturer.
- C. Rollers: Heavy-duty rollers, with steel ball bearings in case-hardened steel races, mounted with varying projections to suit slope of track.
  - 1. Double Hinges: Extend roller shaft through both hinges.
  - 2. Roller Tires: 3-inch- diameter roller tires for 3-inch track; 2-inch- diameter roller tires for 2-inch track.
    - a. Tire Material: Case-hardened steel.
- D. Push/Pull Handles: For push-up-operated or emergency-operated doors, galvanized steel lifting handles on each side of door.
- E. Slide Bolt: Fabricate with side locking bolts to engage through slots in tracks for locking by padlock, located on single-jamb side, operable from inside only.
- F. Locking Device: Fabricate assembly with lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bar to engage through slots in tracks.
  - 1. Locking Bars: Full-disc Cremone type, both jamb sides.
    - a. Operation: From inside only .
  - 2. Lock Cylinder: As specified in Division 8 Section "Door Hardware."
- G. Power-Operated Doors: With safety interlock switch to disengage power supply when door is locked.

## 2.5 COUNTERBALANCING MECHANISM

- A. Extension Spring: Counterbalance mechanism with extension spring and aircraft-type steel cable over ball-bearing sheaves. Provide oil-tempered wired springs with internal safety rods. Combine operation with a spring bumper in each horizontal track to cushion door at end of opening operation.
- B. Torsion Spring: Operation by counterbalance mechanism with adjustable-tension torsion springs, fabricated from oil-tempered-steel wire complying with ASTM A 229/A 229M, Class II, mounted on cross-header tube or steel shaft. Connect to door with galvanized aircraft-type lift cables with cable safety factor of at least 5 to 1. Calibrate springs for 25,000 cycles minimum.
- C. Bracket: Anchor support bracket, as required to connect stationary end of spring to the wall, to level shaft and prevent sag.
- D. Spring Bumper: Include at each horizontal track to cushion door at end of opening operation.

## 2.6 ELECTRIC DOOR OPERATORS

- A. Electric Door Operator, General: Type, size, and capacity recommended and provided by door manufacturer for door and operational life specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking door, disconnect device, emergency auxiliary operator, and accessories required for proper operation.
  - 1. Comply with NFPA 70. Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency auxiliary operator.
- B. Electric Motors: Polyphase, medium-induction type with high-starting torque, reversible, continuous-duty, Class A insulated, electric motors, complying with NEMA MG 1; with overload protection, sized to start, accelerate, and operate door in either direction, from any position, at not less than 2/3 fps or more than 1 fps, without exceeding nameplate ratings or considering service factor. Coordinate wiring requirements and electric characteristics of motors with building electrical system.
  - 1. Provide open dripproof-type motor, and controller with NEMA ICS 6, Type 1 enclosure.
  - 2. Provide totally enclosed, nonventilated or fan-cooled motors, fitted with plugged drain, and controller with NEMA ICS 6, Type 4 enclosure where indicated.
- C. Control Equipment: NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc. Provide momentary-contact, three-button control station.
  - 1. Interior Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
  - 2. Exterior Units: Full-guarded, standard-duty, surface-mounted, weatherproof-type, NEMA ICS 6, Type 4 enclosure, key operated.
- D. Obstruction Detection Device: Provide each motorized door with self-monitoring, four-wire-configured-type, electrically actuated, external automatic safety sensor able to protect full width of door opening. Activation of sensor immediately stops and reverses downward door travel.

Adjustable Limit Switches: Interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install door, track, and operating equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports.
- B. Fasten vertical track assembly to framing at not less than 24 inches o.c. Hang horizontal track from structural overhead framing with angle or channel hangers welded and bolt fastened in place. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.
- C. Lubricate bearings and sliding parts; adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.

3.2 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain doors. Refer to Division 1 Section "Closeout Procedures."

END OF SECTION 08361

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## SECTION 08550 – CLAD WOOD WINDOWS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following aluminum-clad wood-framed window product types:
  - 1. Casement windows.
  - 2. Fixed windows.
  - 3. Bay windows.
- B. See Division 8 Section "Glazing" for glazing requirements for wood windows, including those specified to be factory glazed.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. General: Provide wood windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified and that are of minimum test size required by AAMA/NWWDA 101/I.S.2.
- B. AAMA/NWWDA Performance Requirements: Provide wood windows of the performance class and grade indicated that comply with AAMA/NWWDA 101/I.S.2.
  - 1. Performance Class: HC.
  - 2. Performance Grade: DP 40
  - 3. Exception to AAMA/NWWDA 101/I.S.2: In addition to requirements for performance class and performance grade, design glass framing system to limit lateral deflections of glass edges to less than 1/175 of glass-edge length at design pressure based on testing performed according to AAMA/NWWDA 101/I.S.2, Uniform Load Deflection Test or structural computations.
- C. Thermal Transmittance: Provide wood windows with a whole-window U-value maximum of .55 at 15-mph exterior wind velocity and winter condition temperatures when tested according to NFRC 100.
- D. Solar Heat-Gain Coefficient: Provide wood windows with a whole-window SHGC maximum of .50, determined according to NFRC 200 procedures.
- E. Specific Product Performance Requirements: Comply with Section 2.2 of AAMA/NWWDA 101/I.S.2 as applicable to types of wood windows indicated.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of wood window indicated.
- B. Product test reports.
- C. Maintenance data.

#### 1.4 QUALITY ASSURANCE

- A. Installer: A qualified installer, approved by manufacturer to install manufacturer's products.
- B. Fenestration Standard: Comply with AAMA/NWWDA 101/I.S.2, "Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors," for minimum standards of

performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

- C. Glazing Publications: Comply with published recommendations of glass manufacturers and GANA's "Glazing Manual" unless more stringent requirements are indicated.

## 1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace wood windows that fail in materials and workmanship within 1 years from date of Substantial Completion.
- B. Warranty Period for Metal Finishes: Five years from date of Substantial Completion.
- C. Warranty Period for Glass: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Andersen Corp.
  - 2. Marvin Windows
  - 3. Pella Corporation
  - 4. Weather Shield Mfg.
  - 5. Or Equal

### 2.2 MATERIALS, GENERAL

- A. Aluminum Extrusions and Rolled Aluminum for Cladding, Baked-Enamel Finish: Manufacturer's standard baked enamel complying with AAMA 2603.

- 1. Color: Color as selected by Contracting Officer from manufacturer's standard color range.

### 2.3 GLAZING

- A. Glass and Glazing Materials: Refer to Division 8 Section "Glazing" for glass units and glazing requirements applicable to glazed wood window units.
- B. Glass: Clear, insulating-glass units complying with Division 8 Section "Glazing."
- C. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.

### 2.4 INSECT SCREENS

- A. General: Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches. Locate screens on outside of window and provide for each operable exterior sash or ventilator.
  - 1. Aluminum Tubular Frame Screens: Comply with SMA 1004, "Specifications for Aluminum Tubular Frame Screens for Windows," Residential R-20 class.

- B. Aluminum Insect Screen Frames: Manufacturer's standard aluminum alloy complying with SMA 1004. Fabricate frames with mitered or coped joints, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
    - 1. Aluminum Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet with minimum wall thickness as required for class indicated.
    - 2. Finish: Anodized aluminum or Baked-on organic coating in color selected by Contracting Officer from manufacturer's full range.
  - C. Aluminum Wire Fabric: 18-by-14 mesh of 0.011-inch diameter, coated aluminum wire.
    - 1. Wire-Fabric Finish: Selected by Contracting Officer from manufacturer's standard colors.
- 2.5 FABRICATION
- A. General: Fabricate wood windows, in sizes indicated, that comply with AAMA/NWWDA 101/I.S.2 for performance class and performance grade indicated. Include a complete system for assembling components and anchoring windows.
  - B. Fabricate wood windows that are reglazable without dismantling sash or ventilator framing.
  - C. Weather Stripping: Provide full-perimeter weather stripping for each operable sash and ventilator, unless otherwise indicated.
  - D. Factory machine windows for openings and hardware that is not surface applied.
  - E. Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.
  - F. Glazing Stops: Provide nailed or snap-on glazing stops coordinated with Division 8 Section "Glazing" and glazing system indicated. Provide glazing stops to match sash and ventilator frames.
  - G. BayWindows: Provide wood windows in configuration indicated. Provide window frames, fixed and operating sash, operating hardware, and other trim and components necessary for a complete, secure, and weathertight installation, including the following:
    - 1. Angled mullion posts with interior and exterior trim.
    - 2. Angled interior and exterior extension and trim.
    - 3. Clear pine head and seat boards.
    - 4. Top and bottom plywood platforms.
    - 5. Exterior head and sill casings and trim.
- 2.6 WOOD FINISHES
- A. Factory-Finished Windows: Provide fabricator's standard factory finish consisting of manufacturer's standard finish. Apply finish to exposed exterior and interior wood surfaces.
    - 1. Color: As selected by Contraction Officer from manufacturer's full range.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- B. Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.
- C. Metal Protection: Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in "Dissimilar Materials" Paragraph in Appendix B in AAMA/NWWDA 101/I.S.2.
- D. Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.
- E. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.
- F. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- G. Clean factory-glazed glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels and clean surfaces.
- H. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 08550

## SECTION 08700 – BUILDERS HARDWARE

### PART 1 - GENERAL

#### A. RELATED DOCUMENTS:

1. Drawings and general provisions of Contract apply to work of this section.

### 1.2 SUMMARY:

- A. Definition: "Builders Hardware" includes items known commercially as builders hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frames. Extent of hardware to be provided as indicated on drawings and schedules contained herein. Types of items in this section include, but are not necessarily limited to the following: (Refer to schedule/legend at end of this section.)

1. Hinges
2. Lock cylinders and keys
3. Lock and latch sets, Mortise
4. Door trim units
5. Stops

- B. Types of door stripping and seals, and thresholds include: (See also Section 08730).

1. Weatherstripping and thresholds for exterior doors.
2. Astragals or meeting seals on pair of doors.
3. Smoke seals
  - a. Weatherstripping: Except as otherwise indicated, provide weatherstripping at each edge of every exterior door leaf.

- C. Each door leaf shall have the appropriate hardware for proper operation.

### 1.3 QUALITY ASSURANCE:

- A. Manufacturer: Obtain each kind of hardware (latch and lock sets, hinges, closers, etc.) from only one manufacturer.
- B. Supplier: A recognized builders hardware supplier who has been furnishing hardware in the project's vicinity for a period of not less than 2 years.
- C. Fire-Rated Openings: Provide only UL or FM tested hardware for fire-rated openings in compliance with NFPA Standard No. 80 and complies with requirements of door and door frame labels.
1. Where emergency exit devices are required on fire-rated doors provide UL label on exit devices indicating "Fire Exit Hardware".

### 1.4 SUBMITTALS:

- A. Product Data: Submit manufacturer's standard details, specifications and installation instructions for each type of product required. Furnish templates to other fabricators when required for proper preparation of work to receive stripping and seals.

- B. Hardware Schedule: Submit final hardware schedule in the manner indicated below. Hardware schedules are intended for coordination of work.
  - 1. Final Hardware Schedule Content: Based on builders hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door opening. Include the following information:
    - a. Type, style, function, size and finish of each hardware item.
    - b. Name and manufacturer of each item.
    - c. Location of hardware set cross-referenced to indications on drawings both on floor plans and in door and frame schedule.
    - d. Explanation of all abbreviations, symbols, codes, etc. contained in schedule.
    - e. Mounting locations for hardware.
    - f. Door and frame sizes and materials.
  - 2. Submittal Sequences: Submit schedule per Division 1. Include with schedule the product data, samples, shop drawings of other work affected by builders hardware, and other information for coordinated review of hardware schedule.
  - 3. Keying Schedule: Submit separate detailed schedule indicating clearly how the government's final instructions on keying of locks has been fulfilled.
- C. Samples: Provide when requested.

#### 1.5 PRODUCT HANDLING:

- A. Packaging and distribution to the site of hardware, on a set by set basis, is the responsibility of the supplier.
- B. Inventory hardware until satisfied that the count is correct.
- C. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control, handling and installation of hardware items so that work will not be delayed by hardware losses, both before and after installation.

#### 1.6 JOB CONDITIONS:

- A. Coordination: Coordinate hardware with other work. Tag each item or package separately, per final hardware schedule, including basic installation instructions. Furnish hardware items of proper design for proper installation and function. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.
- B. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Check the shop drawings of such other work, to confirm that adequate provisions are made for the proper installation of hardware.

### PART 2 - PRODUCTS

#### 2.1 SCHEDULED HARDWARE AND ACCESSORIES

- A. Requirements for design, grade, function, finish and size for this Project is indicated in the Builders Hardware Data Sheet and Hardware Schedule/Legend at the end of this section. Products are identified by using hardware designation numbers of the following:
  - 1. Manufacturer's product designations: One or more manufacturers are listed for each hardware type required. An asterisk (\*) after a manufacturer's name indicates

whose product designation is used in the Hardware Schedule for purpose of establishing minimum requirements. Provide either the product designated, or, the comparable product of one of the other manufacturers which comply with the requirements.

2. BHMA numbers taken from the following BHMA standards. Provide products complying with these standards and requirement specified elsewhere in this section.

B. BHMA Standards:

1. Butts and Hinges: ANSI A156.1 (BHMA 101)
2. Locks and Lock Trim: ANSI A156.2 (BHM 601)
3. Architectural Door Trim: ANSI A156.6 (BHMA 1001)
4. Template Hinge Dimensions: ANSI A156.7
5. Auxiliary Locks: BHMA 501
6. Auxiliary Hardware: BHMA 1201
7. Materials and Finishes: As scheduled.

C. Federal Specification numbers taken from following Federal Specifications. Provide products complying with these specifications and requirements specified elsewhere in this section.

1. Locks and Door Trim: FS FF-H-106.
2. Hinges: FS FF-H-116.

2.2 MATERIALS AND FABRICATION:

- A. Hand of Door: The drawings indicate the direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of the door movement as shown.
- B. Base Metals: Product hardware units of the basic metal and forming method indicated, using the manufacturer's standard metal in no case of lesser (commercial recognized) quality than specified for the hardware units by applicable ANSI A156. Do not furnish "optional" materials or forming methods for those indicated.
- C. Fasteners: Manufacture hardware to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws.
- D. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws. Finish exposed screws to match the hardware finish.
- E. Provide concealed fasteners for hardware units which are exposed when the door is closed, except when no standard units are available with concealed fasteners. Do not use through bolts for installation where the bolt head or the nut on the opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work.
- F. Tools for Maintenance: Furnish a complete set of specialized tools as needed for government's continued adjustment, maintenance, removal and replacement of hardware.

2.3 HINGES, BUTTS AND PIVOTS:

- A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

- B. Screws: Furnish Phillips flat-head all-purpose or machine screws for installation of units or Phillips flat-head all-purpose or wood screws for installation into wood. Finish screw heads to match surface of hinges or pivots.
- C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
  - 1. Steel Hinges: Steel pins
  - 2. Exterior Doors: Non-removable pins.
  - 3. Interior Doors: Non-rising pins.
  - 4. Tips: Flat button and matching plug, finished to match leaves, except where hospital tip (HT) indicated.
  - 5. Number of Hinges: Provide number of hinges indicated but not less than three (3) hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height. Provide four (4) hinges for doors beyond 3'0" in width or above 7'0" in height.

#### 2.4 LOCK CYLINDERS AND KEYING:

- A. Supplier will meet with government to finalize keying requirements and obtain final instructions in writing.
- B. Review the keying system with the government and provide the type required (master, grandmaster or great-grandmaster) for new projects or integrated with government's existing system for additions and remodeling projects.
- C. Equip locks with manufacturer's special 6-pin tumbler cylinder, with construction master key feature, which permits voiding of construction keys without cylinder removal.
- D. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.
- E. Comply with the government's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.
- F. Key Material: Provide keys of nickel silver only.
- G. Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system; and 5 grandmaster keys for each grandmaster system.
  - 1. Furnish one extra blank for each lock.
  - 2. Deliver keys to government's representative.

#### 2.5 LOCKS, LATCHES AND BOLTS:

- A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.
  - 1. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.
  - 2. Provide roller type strikes where recommended by manufacturer of the latch and lock units.
- B. Lock Throw: Provide 5/8" minimum throw on latch and deadlock bolts. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.
  - 1. Provide 1/2" minimum throw on other latch and deadlock bolts.

- C. Flush Bolt Heads: Minimum of 1/2" diameter rods of brass, bronze or stainless steel, with minimum 12" long rod.
- D. Exit Device Dogging: Except on fire-rated doors, wherever closers are provided on doors equipped with exit devices, equip units with keyed dogging device to hold the push bar and latch bolt in open position. Provide standard opposite side trim of thumb piece and cylinder.
- E. Rabbeted Doors: Where rabbeted door stiles are indicated, provide special rabbeted front on lock and latch units and bolts.

## 2.6 MATERIALS AND FABRICATION, GENERAL

- A. Conform to sizes, shapes and mounting system recommended by manufacturer for application indicated.
- B. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is replaceable and available from stocks maintained.
- C. Exposed Fasteners for Stripping Seals: Provide exposed fasteners to match finish of stripping and seals.

## 2.7 FABRICATION:

- A. General: Drill and countersink units for anchor screws, at 12" o.c. +/- not more than 3" from ends. Cut to accurate length and cope to fit tight against door frames. Cut thresholds to size and shape with a fine-toothed saw, or cut and mill surfaces smoothly; remove burrs.
- B. Mitered Corners: Fabricate mitered corners to close exposed ends of threshold units which are not concealed by door frames. Return edge profile of thresholds to faces of frames. Provide either mechanical hair-line joints with concealed fastening, or welded joints dressed smooth on exposed faces.

## 2.8 HARDWARE FINISHES:

- A. Provide matching finishes for hardware units at each door or opening to the greatest extent possible.
- B. Provide quality of finish, complying with manufacturer's standards, in no case less than specified for the applicable units of hardware by referenced standards.
- C. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze and aluminum, except as otherwise indicated. The suffix "NL" is used with standard finish designations to indicate "no lacquer".
- D. The designations used in schedules and elsewhere to indicate hardware finishes are the industry-recognized standard commercial finishes, except as otherwise noted.

## PART 3 - EXECUTION

### 3.1 INSTALLATION:

- A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, or required to comply with governing regulations, and except as may be otherwise directed by this document.
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division 9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.
- C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

### 3.2 ADJUST AND CLEAN:

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace unit which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance of occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- C. Instruct government's personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.

### 3.3 BUILDERS HARDWARE DATASHEET

- A. Acceptable hardware manufacturers and designs:
  - 1. An asterisk (\*) indicates manufacturer's numbers and acceptable hardware designs used in schedule for each hardware group or equal.
    - a. Butts and Hinges: Stanley\*, Hager, Lawrence
    - b. Lock/Exit Devices: Sargent, Yale, Schlage\*.
    - c. Stops and Holders: Quality\*, Lawrence, Builder's Brassworks.
    - d. Weatherstrip and Threshold: Pemko\*, Reese, Zero
    - e. Surface Bolts: Ives\*, Baldwin

### 3.4 FINISH:

- A. All new hardware except weatherstrip and thresholds, 605 (BHMA 3) "Bright Brass" unless otherwise noted or for additions or remodeling which match existing finish; weatherstrip and thresholds aluminum finished as per manufacturer.

3.5 HARDWARE SCHEDULE

A. Products to be of the following or equal.

LOCKS SCHLAGE-PLYMOUTH - Bright Brass or match existing.

L-2	605-F51N	Entrance
L-4	605-F80N	Store Door Lock and Knob
L-5	605-F10N	Latch
L-7	F160N	Deadlock
L-8	605-F40N	Privacy

BUTTS - Stanley (1-1/2 Pair Leaf) US26D

B-1	FBB179	4-1/2" x 4-1/2"
B-3	FBB179 SH	4-1/2" x 4-1/2"

STOPS - Quality

S-1	W302 TB-5
S-2	119 ES

WEATHERSTRIP: Pemko Aluminum - Provide astragal weather stripping at all exterior double doors (Pemko 18062AP or 18062DP)

W-1	306 AV
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THRESHOLDS - Pemko Aluminum

T-1	271A with 315 AN (5" full saddle)
T-2	168A (3" 1/2 saddle)
T-3	274A (4" 1/2 saddle)

SMOKE SEALS - Pemko

SS-1	S88D17
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SURFACE BOLTS - Ives

SB-1	360 Rim Strike
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DOOR BOTTOM - Pemko 18062AP or 18062DP

DB-1
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END OF SECTION 08700

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## SECTION 08800 - GLAZING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes glazing for the following products and applications:

1. Windows.
2. Doors.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
    - a. Specified Design Wind Loads: Per manufactures requirements.
    - b. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 deg rees off vertical and under wind action.
      - 1) Load Duration: 60 seconds or less.
    - c. Minimum Glass Thickness for Exterior Lites: Not less than 6 mm.
- C. Thermal Movements: Provide glazing that allows for thermal movements resulting from a maximum change (range) of 120 deg F, 180 deg F in ambient and surface temperatures, respectively, acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
1. For insulating-glass units, properties are based on units with lites 6 mm thick and a nominal 1/2-inch- wide interspace.
  2. Center-of-Glass Solar Heat Gain Coefficient: NFRC 200 methodology using LBL-35298 WINDOW 4.1 computer program.
  3. Solar Optical Properties: NFRC 300.

#### 1.3 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.

- B. Sealant compatibility and adhesion test reports.

#### 1.4 QUALITY ASSURANCE

- A. Sealant Compatibility and Adhesion Testing: Use sealant manufacturer's standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
- B. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.
- C. Glazing Publications: Comply with recommendations of the following, unless more stringent requirements are indicated.
  - 1. GANA Publications: "Glazing Manual" and "Laminated Glass Design Guide."
  - 2. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines."
- D. Insulating-Glass Certification Program: Permanently marked with certification label of National Accreditation and Management Institute.

#### 1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form, made out to Owner and signed by manufacturer, in which manufacturer agrees to furnish replacements for units that deteriorate from normal use by developing defects attributable to the manufacturing process, f.o.b. the nearest shipping point to Project site, within warranty period.
  - 1. Insulating Glass:
    - a. Deterioration: Failure of hermetic seal resulting in obstruction of vision by dust, moisture, or film on interior surfaces of glass.
    - b. Warranty Period: 10 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. In other articles including schedules where subparagraph titles below introduce lists, the following requirements apply for product selection:
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
  - 2. Products: Subject to compliance with requirements, provide one of the products specified.
  - 3. Product: Subject to compliance with requirements, provide the product specified.
  - 4. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
  - 5. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

#### 2.2 GLASS MATERIALS

- A. Annealed Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select).

- B. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent glass, flat); Quality q3 (glazing select).
- C. Insulating-Glass Units: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in the Insulating-Glass Schedule at the end of Part 3.
  - 1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.
  - 2. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated in the Insulating-Glass Schedule at the end of Part 3 are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
  - 3. Sealing System: Dual seal with manufacturers standard primary and secondary sealants.
  - 4. Spacer: Manufacturer's standard .

## 2.3 GLAZING SEALANTS

- A. General: Provide products of type indicated, complying with the following requirements:
  - 1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  - 2. Colors of Exposed Sealants: As selected by Contracting Officer from manufacturer's standard range .
- B. Elastomeric Glazing Sealants: ASTM C 920, Type S (single component), Grade NS (nonsag), Class 25, Use NT (nontraffic), M, G, A, and, as applicable to glazing substrates indicated, O.
- C. Cylindrical Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- D. Glazing Sealant for Fire-Resistive Glazing Products: Identical to product used in test assembly to obtain fire-protection rating.

## 2.4 GLAZING GASKETS

- A. Compression Gaskets: Molded or extruded gaskets of type and material indicated below and of profile and hardness required to maintain watertight seal:
  - 1. Neoprene or EPDM dense compression gaskets complying with ASTM C 846.
  - 2. Silicone dense compression gaskets complying with ASTM C 1115.
  - 3. Neoprene or EPDM soft compression gaskets complying with ASTM C 509, Type II, black.

## 2.5 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

## 2.6 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.

## PART 3 - EXECUTION

### 3.1 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
  - 1. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
  - 2. Protect glass edges from damage during handling and installation. Remove glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance from Project site and legally dispose of off Project site.
  - 3. Apply primers to joint surfaces where required for adhesion of sealants, as determined by sealant compatibility and adhesion testing.
  - 4. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
  - 5. Provide spacers for glass lites where the length plus width is larger than 50 inches unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances.
- B. Protection:
  - 1. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface.
  - 2. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter.
  - 3. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged, including natural causes, accidents, and vandalism during construction period.

END OF SECTION 08800

## SECTION 09260 - GYPSUM BOARD ASSEMBLIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:

1. Interior gypsum wallboard.
2. Tile backing panels.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Samples: For each textured finish indicated and on same backing indicated for Work.

#### 1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
  2. Products: Subject to compliance with requirements, provide one of the products specified.
  3. Product: Subject to compliance with requirements, provide the product specified.

#### 2.2 PANEL PRODUCTS

- A. Panel Size, General: Provide in maximum lengths and widths available that will minimize joints in each area and correspond with support system indicated.
- B. Gypsum Wallboard: ASTM C 36.
1. Regular Type: In thickness indicated and with long edges tapered.
  2. Type X: In thickness indicated and with long edges tapered.
- C. Sag-Resistant Gypsum Wallboard: ASTM C 36, manufactured to have more sag resistance than regular-type gypsum board, 5/8 inch thick, and with long edges tapered. Apply on ceiling surfaces.

- D. Proprietary, Special Fire-Resistive Type: ASTM C 36, having improved fire resistance over standard Type X, complying with requirements of fire-resistance-rated assemblies indicated, in thickness indicated, and with long edges tapered.

- E. Tile Backing Panels:

- 1. Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M, with core type and in thickness indicated.

## 2.3 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.

- 1. Cornerbead: Use at outside corners.
  - 2. LC-Bead: Use at exposed panel edges.
  - 3. L-Bead: .
  - 4. U-Bead: .

## 2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475.

- B. Joint Tape:

- Interior Gypsum Wallboard: Paper

- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

- 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
  - 2. Embedding and First Coat: For embedding tape and first coat on joints, flanges of trim accessories, and fasteners, use setting-type taping compound.
    - a. Use setting-type compound for installing paper-faced metal trim accessories.
  - 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
  - 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
  - 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

## 2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

- C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

- 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

## 2.6 TEXTURE FINISHES

- A. Primer: As recommended by textured finish manufacturer.

- 1. Texture: Light-spatter .

## PART 3 - EXECUTION

### 3.1 PANEL PRODUCT INSTALLATION

- A. Gypsum Board: Comply with ASTM C 840 and GA-216.
  - 1. Space screws a maximum of 12 inches o.c. for vertical applications.
  - 2. Space fasteners in panels that are tile substrates a maximum of 8 inches o.c.
  - 3. On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
  - 4. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of board.
    - b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
  - 5. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
  - 6. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.
  - 7. Multilayer Fastening Methods: Fasten base layers and face layers separately to supports with screws.
  - 8. Laminating to Substrate: Comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.
- B. Water-Resistant Backing Panels:
  - 1. Water-Resistant Gypsum Backing Board: Install with 1/4-inch gap where panels abut other construction or penetrations.

### 3.2 FINISHING

- A. Installing Trim Accessories: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Finishing Gypsum Board Panels: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.
  - 1. Prefill open joints, rounded or beveled edges, and damaged surface areas.
  - 2. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

3. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
  4. Glass-Mat, Water-Resistant Backing Panels: Finish according to manufacturer's written instructions.
- C. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:
1. Level 1: Embed tape at joints in ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
  2. Level 4: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges.
  3. Level 5: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges, and apply skim coat of joint compound over entire surface.

### 3.3 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture free of starved spots or other evidence of thin application or of application patterns.
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture finish manufacturer's written recommendations.

END OF SECTION 09260

## SECTION 09652 - SHEET VINYL FLOOR COVERINGS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes sheet vinyl floor coverings, with and without backings.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Samples for Verification: In manufacturer's standard size, but not less than 6-by-9-inch sections of each different color and pattern of floor covering required.
- C. Qualification Data: For Installer.

#### 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project that are competent in heat-welding techniques required by manufacturer for floor covering installation.
  - 1. Engage an installer who employs workers for this Project that are trained or certified by floor covering manufacturer for heat-welding techniques required.

#### 1.4 PROJECT CONDITIONS

- A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 85 deg F, in spaces to receive floor tile during the following time periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. After postinstallation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor covering installation.
- D. Close spaces to traffic for 48 hours after floor covering installation.
- E. Install floor coverings after other finishing operations, including painting, have been completed.

### PART 2 - PRODUCTS

#### 2.1 SHEET VINYL FLOOR COVERING

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Armstrong World Industries, Inc.;
  - 2. GAF Corp., Floor Products Division;
  - 3. Dynamit Nobel of America.
  - 4. Kentile Floors, Inc.;
  - 5. Or Approved Equal

- B. Unbacked Sheet Vinyl Floor Covering: ASTM F 1913, 0.080 inch thick.
  - 1. Similar to Amrstrong Classic Corlon.
- C. Sheet Vinyl Floor Covering With Backing: ASTM F 1303.
  - 1. Type (Binder Content): I, minimum binder content of 90 percent.
  - 2. Wear-Layer Thickness: Grade 1.
  - 3. Overall Thickness: .080" min.
  - 4. Interlayer Material: None.
  - 5. Backing Class: Class A (fibrous) .
- D. Color and Pattern: As selected by Contracting Officer from manufacturer's full range.
- E. Wearing Surface: Embossed.
- F. Sheet Width: As standard with manufacturer to eliminate seams
- G. Seaming Method: Standard.
- H. Fire-Test-Response Characteristics:
  - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648.

## 2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement based formulation provided or approved by floor covering manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit sheet vinyl floor covering and substrate conditions indicated.
- C. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of floor coverings, and in maximum available lengths to minimize running joints.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of floor coverings.
- B. Concrete Substrates: Prepare according to ASTM F 710.
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
  - 3. Moisture Testing:

- a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
  - b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- C. Remove substrate coatings and other substances that are incompatible with floor covering adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- D. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.
- E. Move floor coverings and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
  - 1. Do not install floor coverings until they are same temperature as space where they are to be installed.
- F. Sweep and vacuum clean substrates to be covered by floor coverings immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Unroll sheet vinyl floor coverings and allow them to stabilize before cutting and fitting.
- B. Lay out sheet vinyl floor coverings as follows:
  - 1. Maintain uniformity of floor covering direction.
  - 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in floor covering substrates.
  - 3. Match edges of floor coverings for color shading at seams.
  - 4. Avoid cross seams.
- C. Scribe and cut floor coverings to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.
- D. Extend floor coverings into toe spaces, door reveals, closets, and similar openings.
- E. Maintain reference markers, holes, or openings that are in place or marked for future cutting by repeating on floor coverings as marked on substrates. Use chalk or other nonpermanent marking device.
- F. Adhere floor coverings to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- G. Perform the following operations immediately after completing floor covering installation:
  - 1. Remove adhesive and other blemishes from floor covering surfaces.
  - 2. Sweep and vacuum floor coverings thoroughly.
  - 3. Damp-mop floor coverings to remove marks and soil.
- a. Do not wash floor coverings until after time period recommended by manufacturer.

- H. Protect floor coverings from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

END OF SECTION 09652

## SECTION 09653 - RESILIENT WALL BASE AND ACCESSORIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:

1. Wall base.
2. Stair accessories.
3. Molding accessories.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Samples: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches long, of each resilient product color, texture, and pattern required.

#### 1.3 PROJECT CONDITIONS

- A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:
1. 48 hours before installation.
  2. During installation.
  3. 48 hours after installation.
- B. After postinstallation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.
- B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

#### 2.2 COLORS AND PATTERNS

- A. Colors and Patterns: As selected by Contracting Officer from manufacturer's full range.

#### 2.3 RESILIENT WALL BASE

- A. Wall Base: ASTM F 1861.
1. Armstrong World Industries, Inc.;
  2. Azrock Commercial Flooring, DOMCO;.
  3. Burke Mercer Flooring Products;.
  4. Flexco Div., Div. Of Burke Products Inc.;

- 5. GAF Corp.; Floor Products Div.
- 6. Kentile Floor, Inc.
- 7. Mercer Plastic Co. Inc.
- 8. R.C. Musson Rubber Co.

- B. Type (Material Requirement): TS (rubber, vulcanized thermoset) or TP (rubber, thermoplastic).
- C. Group (Manufacturing Method): I (solid, homogeneous) or II (layered) .
- D. Style: Cove (with top-set toe) .
- E. Minimum Thickness: 0.125 inch .
- F. Height: 4 inches.
- G. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.
- H. Outside Corners: Job formed or premolded.
- I. Inside Corners: Job formed or premolded.
- J. Surface: Smooth.

#### 2.4 RESILIENT MOLDING ACCESSORY

- A. Description: Cap for cove carpet, Cap for cove resilient sheet floor covering, Carpet edge for glue-down applications Reducer strip for resilient floor covering .
- B. Material: Rubber.
- C. Profile and Dimensions: As indicated.

#### 2.5 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement based formulation provided or approved by resilient product manufacturers for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.
- B. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- C. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.

- D. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
  - 1. Do not install resilient products until they are the same temperature as the space where they are to be installed.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 RESILIENT WALL BASE INSTALLATION

- A. Apply wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- B. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- C. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- D. Do not stretch wall base during installation.
- E. Premolded Corners: Install premolded corners before installing straight pieces.
- F. Job-Formed Corners:
  - 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are only deep enough to produce a snug fit without removing more than half the wall base thickness.
  - 2. Inside Corners: Use straight pieces of maximum lengths possible. Form by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

### 3.3 RESILIENT ACCESSORY INSTALLATION

- A. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor coverings that would otherwise be exposed.

### 3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing resilient product installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.
    - a. Do not wash surfaces until after time period recommended by manufacturer.
- B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

END OF SECTION 09653

## SECTION 09680 - CARPET

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes tufted carpet and carpet cushion.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Include the following:
  - 1. Existing floor materials to be removed.
  - 2. Existing floor materials to remain.
  - 3. Seam locations.
  - 4. Pattern type, repeat, location, direction, and starting point.
  - 5. Pile direction.
  - 6. Insets and borders.
  - 7. Transition, and other accessory strips.
  - 8. Transition details to other flooring materials.
- C. Samples: For each for each carpet, cushion, and exposed accessory and for each color and pattern required.
- D. Product Schedule: Use same room and product designations indicated on Drawings and in schedules.
- E. Maintenance data.

#### 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104, Section 5, "Storage and Handling."

#### 1.5 PROJECT CONDITIONS

- A. General: Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity."
- B. Environmental Limitations: Do not install carpet and cushion until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet tile before installing these items.

#### 1.6 WARRANTY

- A. Carpet Warranty: Manufacturer's standard form in which manufacturer agrees to replace carpet that does not comply with requirements or that fails within 2 years from date of Substantial

Completion. Warranty does not include deterioration or failure of carpet from unusual traffic, failure of substrate, vandalism, or abuse. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, and delamination.

- B. Carpet Cushion Warranty: Manufacturer's standard form agreeing to replace carpet cushion that does not comply with requirements or that fails within 2 years from date of Substantial Completion. Warranty does not include deterioration or failure of carpet cushion from unusual traffic, failure of substrate, vandalism, or abuse. Failure includes, but is not limited to, permanent indentation or compression.

## PART 2 - PRODUCTS

### 2.1 CARPET

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- B. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Carpet specifications based on Shaw; Highland Plush or approved equal. Approved equal by Contracting Officer.
    - a. Color and Pattern: # 17231 "Straw".
- C. Surface Pile Weight: 45 oz. sq. yard minimum
- D. Total Weight: 4,843 oz./sq. yard for finished carpet.
- E. Primary Backing: Polypropylene.
- F. Secondary Backing: Polyurethane attached cushion backing
- G. Width: 12' Broadloom
- H. Critical Radiant Flux Classification: Class I, not less than 0.45 w/sq. cm per ASTM E 648.

### 2.2 CARPET CUSHION

- A. Traffic Classification: CCC Class II, heavy traffic.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with CRI 104, Section 8, "Direct Glue-Down." 10, "Attached Cushion."
- B. Comply with CRI 104, Section 12, "Carpet on Stairs."
- C. Maintain uniformity of carpet direction and lay of pile. At doorways, center seams under door in closed position. Bind or seal cut edges as recommended by carpet manufacturer.
- D. Install pattern parallel to walls and borders.

END OF SECTION 09680

## SECTION 09900 – PAINTING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract apply to work in this section.

#### 1.2 SUMMARY:

- A. Extent of painting work is indicated on drawings, Room Finish Schedule and as herein specified.
- B. The work includes painting and finishing of interior surfaces throughout the project, except as otherwise indicated.
  - 1. Surface preparation, priming and coats of painting specified are in addition to shop priming and surface treatment specified under other sections of work.
- C. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
- D. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.
- E. Finished Metal Surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting, unless otherwise indicated.
- F. Operating Parts and Labels: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting, unless otherwise indicated.
  - 1. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

#### 1.3 SUBMITTALS:

- A. Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.
- B. Samples: Submit samples for contracting officer's review of color and texture only. Provide a listing of material and application for each coat of each finish sample.

#### 1.4 DELIVERY AND STORAGE:

- A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label.

1.5 JOB CONDITIONS:

- A. Apply water-base paints only when temperature of surface to be painted and surrounding air temperatures are between 50 degrees F (10 degrees C) and 90 degrees F (32 degrees C), unless otherwise permitted by paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degrees F (7 degrees C) and 95 degrees F (35 degrees C), unless otherwise permitted by paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by paint manufacturer's printed instructions.
  - 1. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 COLORS AND FINISHES:

- A. Prior to beginning work, contracting officer will furnish color chips for surfaces to be painted.
- B. Use representative colors when preparing samples for review.
- C. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.
- D. Paint Coordination: Provide finish coats which are compatible with prime paints used. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information on characteristics of finish materials proposed for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and reprime as required. Notify contracting officer in writing of any anticipated problems using specified coating systems with substrates primed by others.

2.2 MATERIAL QUALITY:

- A. Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.
- B. Proprietary names used to designate colors or materials are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.
- C. Provide undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.
- D. Manufacturers:
  - 1. Columbia \* numbers referenced
  - 2. Sherwin Williams
  - 3. Pittsburg Paints
  - 4. Pratt & Lambert

5. Benjamin Moore
6. Sonneborn
7. Thoroseal
8. Or Approved Equal

## 2.3 INTERIOR PAINTING SYSTEMS:

- A. Provide following paint systems for various substrates, as indicated.
- B. Interior Metal - IP-2: IP-2.1
  1. 1st Coat - Acry-Prime Stain Blocking Primer
  2. 2nd Coat - Interior latex enamel emulsion
  3. 3rd Coat - Interior latex enamel emulsion
    - a. First coat not required on items that are shop primed. Verify with paint manufacturer for compatibility.
    - b. This includes ALL exposed mechanical ductwork and electrical conduit.
    - c. Wash with a 5% phosphoric acid solution, rinse thoroughly and dry before applying paint.
- C. Painted Wood - IP-5: IP-5.1
  1. 1st Coat - Primer sealer 03-721
  2. 2nd Coat - Gloss enamel 04-271
  3. 3rd Coat - Gloss enamel 04-721
- D. Drywall (Epoxy) IP6.2
  1. 1st Coat - Primer sealer 03-721
  2. 2nd Coat - 2 component epoxy 05-900
  3. 3rd Coat - 2 component epoxy 05-900
- E. Gypsum Drywall Systems:IP-6.4
  1. 1st Coat - Latex enamel undercoater 02-735
  2. 2nd Coat - Eggshell enamel 03-740
  3. 3rd Coat - Eggshell enamel 03-740
- F. Concrete Floor Sealer - IP-8: IP-8.1
  1. 1st Coat - Sonneborn Sonoglaze
  2. 2nd Coat - Sonneborn Sonoglaze

## 2.4 EXTERIOR PAINT SYSTEMS:

- A. Provide the following paint systems for various substrates as indicated:
- B. Ferrous Metal - EPS - 1: EPS - 1.3:
  1. Lusterless Alkyd Enamel: Alkyd base flat enamel for use over prime coated ferrous metal:
    - a. 1st Coat - 05-200 PP Acry-Prime Stain Blocking Primer
    - b. 2nd Coat - 01-265 Acry-Shield Eggshell Enamel
    - c. 3rd Coat - 01-265 Acry-Shield Eggshell Enamel
- C. Zinc Coated Metal - EPS-2: EPS 2.1:
  1. 1st Coat - Acry-Prime Stain Blocking Primer
  2. 2nd Coat - 03-241 Alkyd Interior/Exterior Semi-Gloss
  3. 3rd Coat - 03-241 Alkyd Interior/Exterior Semi-Gloss

- D. Exterior Wood - EPS - 5: EPS-5.1:
  - 1. Exterior Acrylic Emulsion: Quick-drying, flat acrylic paint for use on the exterior over prime-coated wood and sealed and prime-coated painted plywood:
    - a. 1st Coat: 01-727 Exterior Acrylic Latex Primer
    - b. 2nd Coat - 01-002 Series Acrylic Finish
    - c. 3rd Coat - 01-002 Series Acrylic Finish

### PART 3 - EXECUTION

#### 3.1 INSPECTION:

- A. Applicator must examine areas and conditions (including surface conditions under which painting work is to be applied and notify contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to applicator.
- B. STARTING of painting work will be construed as APPLICATOR'S ACCEPTANCE of surfaces and conditions within any particular area.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces or conditions otherwise detrimental to formation of a durable paint film.

#### 3.2 SURFACE PREPARATION:

- A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
- B. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall into wet, newly-painted surfaces.
- C. Cementitious Materials: Prepare cementitious surfaces of concrete, concrete block, and cement plaster to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.
- D. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
- E. Wood: Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.

- F. Ferrous Metals: Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent, sanding, steel wool or mechanical cleaning.
  - 1. Touch-up shop-applied prime coats wherever damaged or bare, where required by other sections of these specifications. Clean and touch-up with same type shop primer.
- G. Drywall Surfaces: Verify all joints and taping are smooth and will not show when final painted wall is subjected to light. No visible joints will be accepted.

### 3.3 MATERIALS PREPARATION:

- A. Mix and prepare painting materials in accordance with manufacturer's directions. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

### 3.4 APPLICATION:

- A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
  - 1. Sand lightly between each succeeding enamel, stain or varnish coat.
  - 2. Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.
  - 3. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 4. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate per coat to establish a total dry film thickness.
- D. Prime Coats: Apply prime coat of material which is required to be painted or finished, and which has not been prime coated by others.
  - 1. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- E. Apply oil base paint under counters over dishwashers.
- F. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

3.5 FINISH:

- A. Final surface texture is to be:
  - 1. Smooth
  - 2. Eggshell
  - 3. Stipple
  - 4. Match Existing

3.6 CLEAN-UP AND PROTECTION:

- A. Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- B. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to contracting officer.
- C. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
- D. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION 09900

## SECTION 10550 - POSTAL SPECIALTIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:

1. Individual unit mailboxes as shown and specified.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Samples: For each exposed finish.
- C. Product certificates, including written approval by Postmaster General.
- D. Maintenance data.
- E. Other Informational Submittals: Final USPS local postmaster approval for installed postal specialties to be served by USPS.

#### 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver lock keys to Contraction Officer by registered mail or overnight package service with a record of each corresponding lock and key number.

#### 1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of postal specialties that fail in materials or workmanship within 1 year from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated, and as follows:
1. Sheet and Plate: ASTM B 209.
  2. Extruded Shapes: ASTM B 221.
- B. Steel Sheet: Cold rolled, ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- C. Metallic-Coated Steel Sheet: Galvanized steel sheet, ASTM A 653/A 653M, G60 coating designation; or electrolytic zinc-coated steel sheet, ASTM A 591/A 591M, Class C coating.
- D. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers.

#### 2.2 ACCESSORIES

- A. Key Cabinets: Wall-mounted, metallic-coated steel cabinet with pivoting, key-holding panels and side-hinged door equipped with five-pin tumbler, cylinder door lock and concealed, full-length flush hinge. Finish cabinet, panels, and door with baked-enamel finish. Provide key control system consisting of key-holding hooks, labels, two sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers.

- 1. Cross-Index System: Consisting of index cards for recording key information. Include three receipt forms for each key-holding hook.

## 2.3 FABRICATION

- A. Preassemble postal specialties in shop to greatest extent possible to minimize field assembly. Form postal specialties to required shapes and sizes, with true lines and angles, square, rigid, and without warp, with metal faces flat and free of dents or distortion. Make exposed metal edges and corners free of sharp edges and burrs, and safe to touch.
- B. Form joints exposed to weather to exclude water penetration.
- C. Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation.

## 2.4 FINISHES

- A. Finish postal specialties after assembly.
- B. Aluminum Baked-Enamel Finish: Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.
  - 1. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system with a minimum dry film thickness of 1.5 mils, medium gloss.
- C. Steel Finishes: Unless otherwise indicated, finish steel surfaces exposed to view with baked-enamel or powder-coated finish.
- D. Steel Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Metal Protection: Where aluminum and copper alloys will contact grout, concrete, masonry, wood, or dissimilar metals, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation.
- B. Final acceptance depends on compliance with USPS requirements.

### 3.2 FIELD QUALITY CONTROL

- A. Obtain written final approval from USPS postmaster that authorizes mail collection.

END OF SECTION 10550

## SECTION 10801 - TOILET AND BATH ACCESSORIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:

1. Toilet and bath accessories.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

#### 1.3 WARRANTY

- A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace mirrors that develop visible silver spoilage defects within 2 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Toilet and Bath Accessories:
    - a. Hallmack-Nutone / Div. Scovill or Approved equal by Contracting Officer.

#### 2.2 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, No. 4 finish (satin), 0.0312-inch minimum nominal thickness, unless otherwise indicated.
- B. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- C. Mirror Glass: ASTM C 1036, Type I, Class 1, Quality q2, nominal 6.0 mm thick, with silvering, electroplated copper coating, and protective organic coating complying with FS DD-M-411.
- D. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- E. Fasteners: Screws, bolts, and other devices of same material as accessory unit.

#### 2.3 TOILET AND BATH ACCESSORIES

- A. Toilet Tissue Dispenser:
1. Nutone HM-375
  2. Mounting: Recessed.
  3. Material: Chrome-plated zinc alloy (zamac) or steel.

- B. Mirror Unit:
  - 1. Float Glass Mirror
  - 2. Frame: Frameless.
- C. Shower Curtain Rod:
  - 1. Nutone HM-382-A
- D. Medicine Cabinet:
  - 1. Nutone AH 75 Heritage. Manufacturer's unfinished door. Stain finish per Section 09900-Painting or Nutone HM-FS-470, mirror doors
  - 2. Type: Recessed, for nominal 4-inch wall depth.
  - 3. Shelves: Three, adjustable.
- E. Robe Hook:
  - 1. Double-Prong Unit: Stainless-steel, double-prong robe hook with rectangular wall bracket and backplate for concealed mounting.
- F. Towel Holder:
  - 1. Nutone HM-394-24
  - 2. Towel Bar: 24-inch- long, stainless-steel, 3/4-inch- square tube with rectangular end brackets and galvanized steel backplates for concealed mounting.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install accessories using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

END OF SECTION 10801

## SECTION 11451 - RESIDENTIAL APPLIANCES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Ranges.
  - 2. Range hoods.
  - 3. Refrigerator/freezers.
  - 4. Dishwashers.
- B. See Division 15 Sections for natural gas, water distribution, drainage, and vent piping and plumbing fixtures.
- C. See Division 16 Sections for electrical services and connections to residential appliances.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Appliance Schedule: Use same room designations shown on Drawings.

#### 1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. UL and NEMA Compliance: Provide electrical components required as part of residential appliances that are listed and labeled by UL and that comply with applicable NEMA standards.
- C. AGA and ANSI Standards: Provide gas-burning appliances that carry the design certification seal of AGA and that comply with ANSI Z21-Series standards.
- D. AHAM Standards:
  - 1. Refrigerators and Freezers: Total volume and shelf area ratings certified according to ANSI/AHAM HRF-1.
- E. Energy Ratings: Provide residential appliances that carry labels indicating energy-cost analysis (estimated annual operating costs) and efficiency information as required by the Federal Trade Commission.

#### 1.4 DELIVERY

- A. Deliver appliances only after utility rough-in is complete and construction in spaces to receive appliances is substantially complete and ready for installation.

#### 1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace appliance that fails in materials and workmanship within specified warranty period.
  - 1. Refrigerator/Freezer: Five -year limited warranty on sealed refrigeration system.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for each residential appliance is based on the product named. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

### 2.2 RESIDENTIAL APPLIANCES

- A. Gas Range: With four-burner cooktop and oven and broiler, design certified and listed by AGA. (Government furnished, Contractor install)

- 1. Basis-of-Design Product: SunRay Model 5BK26FXOP114236/NW or better
  - 2. Width: 30 inches .
  - 3. Oven Cleaning: Manual.
  - 4. Color: White with black front and control trim.

- B. Exhaust Hood: UL listed.

- 1. Width: 30 inch.
  - 2. Type: Wall mounted.
  - 3. Fan Speed: Variable .
  - 4. Exhaust: Vertical.
  - 5. Color: White to match range.

- C. Refrigerator/Freezer: Freestanding, two-door refrigerator with freezer, UL listed. (Government furnished, Contractor install)

- 1. Basis-of-Design Product: Kenmore Model 2539368722 or Magic Chef Model CTF2124ARW
  - 2. Type: Top-mounted freezer.
  - 3. Defrosting: Frost free .
  - 4. Size: 21 cu ft
  - 5. Color: White, fully textured exterior.
  - 6. Installed ice maker with storage bin.
  - 7. Dairy compartment
  - 8. Reversible doors
  - 9. Egg tray storage
  - 10. Freezer door shelves
  - 11. Adjustable shelves

- D. Dishwasher: Magic Chef Model DU2500V or better

- 1. Color: White front.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Built-in Appliances: Securely anchor to supporting cabinetry or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- B. Freestanding Appliances: Place in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

END OF SECTION 11451

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## SECTION 11480 – PLAYGROUND EQUIPMENT

### PART 1 - GENERAL:

#### 1.1 SUMMARY:

- A. Composite playground equipment/structure.

#### 1.2 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract apply to work of this section.

#### 1.3 QUALITY ASSURANCE:

- A. Assemblies shall meet ADA requirements for accessibility and CPSC Handbook for Public Playground Safety (<http://www.cpsc.gov>).
- B. Provide complete assembly as specified herein from single manufacturer.
- C. Installer shall have installations of similar nature that have been in service for minimum 3 years.

#### 1.4 WARRANTY:

- A. Provide manufacturer's standard warranty.

### PART 2 - PRODUCTS:

#### 2.1 ACCEPTABLE MANUFACTURERS:

- A. Miracle Recreation Equipment Co., P.O. Box 420, Monett, MO 65708, (Phone 1-417-235-6917) or approved equal.
  - 1. Model Number: Kid's Choice # 714-031 Center Stage and 714-852-2S Arch Swing.

#### 2.2 MATERIALS:

- A. Composite wood materials with non-corrosive attachments/elements.
- B. Complete with manufacturer's standard hardware, and installation instructions.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION:

- A. Install equipment to conform with manufacturer's instructions.
- B. Coordinate installation of footings for the play equipment with installing concrete paving.

END OF SECTION 11480

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## SECTION 12491 - HORIZONTAL LOUVER BLINDS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following blinds with aluminum louver slats:
  - 1. Miniblinds.

#### 1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, details of installation, operational clearances, and relationship to adjoining Work.
  - 1. Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.
- C. Samples: For each exposed finish and for each color and texture required.
- D. Window Treatment Schedule: Use same room designations indicated on Drawings.
- E. Maintenance data.

#### 1.3 QUALITY ASSURANCE

- A. Horizontal Louver Blinds Fire-Test-Response Characteristics: Provide products passing flame-resistance testing according to NFPA 701 by a testing agency acceptable to authorities having jurisdiction.
- B. Corded Window Covering Product Standard: Unless otherwise indicated, comply with WCMA A 100.1.

### PART 2 - PRODUCTS

#### 2.1 HORIZONTAL LOUVER BLINDS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- B. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Hunter Douglas Window Fashions;
  - 2. Levolor Contract;
  - 3. Marathon Carey-McFall Div., Marathon .
  - 4. Or Approved Equal by Contracting Officer.
- C. Finish: Ionized coating; antistatic, dust-repellent, baked polyester.
  - 1. Slats: One color as indicated.
  - 2. Headrails/Valances: Match louver slats as indicated.
  - 3. Component Color: Rails, cords, ladders, and exposed-to-view metal and plastic matching or coordinating with slat color.
  - 4. Colors, Textures, Patterns, and Glosses: As selected by Contracting Officer from manufacturer's full range.

- D. Louver Slats: Aluminum, alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radiused corners.
  - 1. Miniblinds:
    - a. Nominal Slat Width: 1 inch.
    - b. Slat Spacing: Manufacturer's standard.
  - 2. Nominal Slat Thickness: Not less than 0.010" thick.
  - 3. Perforated Slats: Openness factor of 6 to 7 percent.
- E. Headrail: Formed steel or extruded aluminum; long edges returned or rolled; fully enclosing operating mechanisms on three sides and ends.
- F. Headrail/Valance: Decorative, integrated headrail/valance not requiring a separate valance or end brackets for finished appearance; formed steel or extruded aluminum; long edges returned or rolled; fully enclosing operating mechanisms on three sides and ends.
- G. Bottom Rail: Formed-steel or extruded-aluminum tube, sealed with plastic or metal capped ends; with enclosed and protected ladders and tapes to prevent their contact with sill.
  - 1. Top contoured to match crowned shape of louver slat.
  - 2. Bottom contoured for minimizing light gaps.
- H. Maximum Light Blocking Blinds: Designed for eliminating all visible light gaps if slats are tilted closed; with tight tape spacing indicated and slats with minimal-sized rout holes for ladders hidden and placed near back edge for maximum slat overlap; with headrail and bottom rail extended and formed for light-tight joints between rail and adjacent slats or construction.
- I. Tilt Control: Enclosed worm gear mechanism and linkage rod.
  - 1. Tilt Operation: Manual with clear plastic wand or cord-operated tilter.
  - 2. Length of Tilt Control: Length required to make operation convenient from floor level.
  - 3. Tilt: Full.
- J. Lift Operation: Manual, cord lock; locks pull cord to stop blind at any position in ascending or descending travel.
- K. Lift Operation: Manual, top-locking cord lock; locks pull cord to stop blind in either fully opened or fully closed position only and is equipped with a ring pull not more than 4 inches long.
- L. Tilt-Control and Cord-Lock Position: Right side and left side of headrail, respectively, unless otherwise indicated.
- M. Ladders: Evenly spaced to prevent long-term louver sag.
  - 1. Material: Braided string .
    - a. Tape Color, Texture, and Pattern: As indicated by manufacturer's designations .
- N. Valance: Manufacturer's standard.
- O. Mounting: End permitting easy removal and replacement without damaging blind or adjacent surfaces and finishes; with spacers and shims required for blind placement and alignment indicated.

1. Provide intermediate support brackets if end support spacing exceeds spacing recommended by manufacturer for weight and size of blind.

## 2.2 FABRICATION

- A. Product Standard and Description: Comply with AWCMA Document 1029, unless otherwise indicated.
- B. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.
  1. Lifting and Tilting Mechanisms: With permanently lubricated moving parts.
- C. Unit Sizes: Fabricated in sizes to fill window and other openings as follows, measured at 74 deg F:
  1. Blind Units Installed between (Inside) Jambs:
    - a. Width: Equal to 1/4 inch per side or 1/2 inch total, plus or minus 1/8 inch, less than jamb-to-jamb dimension of opening in which each blind is installed.
    - b. Length: Equal to 1/4 inch, plus or minus 1/8 inch, less than head-to-sill dimension of opening in which each blind is installed.
  2. Blind Units Installed Outside Jambs: Width and length as indicated, with terminations between blinds of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
- D. Installation Brackets: Designed for easy removal and reinstallation of blind, for supporting headrail, valance, and operating hardware, and for hardware position and blind mounting method indicated.
- E. Installation Fasteners: Not fewer than two fasteners per bracket, fabricated from metal noncorrosive to blind hardware and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install blinds level and plumb and aligned with adjacent units according to manufacturer's written instructions. Install intermediate support as required to prevent deflection in headrail. Allow clearances between adjacent blinds and for operating glazed opening's operation hardware, if any.
  1. Location: Exterior louver edges in any position are not closer than 1 inch to interior face of glass.
- B. Flush Mounted: Install blinds with louver edges flush with finish face of opening if slats are tilted open.
- C. Jamb Mounted: Install headrail flush with face of opening jamb and head.
- D. Head Mounted: Install headrail on face of opening head.
- E. Recessed: Install headrail concealed within blind pocket.

- F. Adjusting: Adjust horizontal louver blinds to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
- G. Cleaning: Clean blind surfaces after installation, according to manufacturer's written instructions.

END OF SECTION 12491

## SECTION 12574 – OUTDOOR SITE ITEMS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes furniture, trash receptacles and picnic shelters used in outdoor areas.

#### 1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.3 SUBMITTALS

- A. Product Data: For each item specified. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes.
- B. Maintenance Data: To include in the maintenance manuals specified in Division 1.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type item through one source from a single manufacturer.

### PART 2 - PRODUCTS

#### 2.1 OUTDOOR SITE ITEMS

- A. Product: Subject to compliance with requirements, provide outdoor site items specified in the Outdoor Site Item Schedule at the end of this Section.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Anchor outdoor site items in place using attachment method complying with manufacturer's written instructions.

#### 3.2 ADJUSTING

- A. Adjust moving parts to ensure they are fully operational.

#### 3.3 OUTDOOR SITE ITEM SCHEDULE

- A. Outdoor Site Item Designation: OF-[1] Bench.
  - 1. Provide one [1] bench at tot lot
  - 2. Provide four [4] benches where indicated along jogging path.
    - a. Manufacturer: Columbia Cascade
    - b. Manufacturer's Product Designation: Timberform Restoration - 6 foot
    - c. Source Address: 1975 S.W. Fifth Ave. Portland, Oregon 97201-5293
    - d. Source Phone Number: 1-800-547-1940
    - e. or approved equal
- B. Outdoor Site Item Designation: OF-[2] Trash Receptacle
  - 1. Provide three [3] trash receptacles where indicated on drawing - Federal Color #37056.
    - a. Manufacturer: Columbia Cascade
    - b. Manufacturer's Product Designation: Timberform Renaissance 30
    - c. Source Address: 1975 S.W. Fifth Ave. Portland, Oregon 97201-5293
    - d. Source Phone Number: 1-800-547-1940
    - e. or approved equal

END OF SECTION 12574

## SECTION 15010 - MECHANICAL PROVISIONS

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. The work under this Division includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing and operation of all mechanical work for this project, as shown on the Drawings and defined in this Division of the specifications.

#### 1.2 QUALITY ASSURANCE

- A. Substitutions:
  - 1. Whenever any material or equipment is specified by patent or proprietary name or by the name of the manufacturer, such specification establishes the standard of quality in that particular field of manufacture.
  - 2. When approved substitute equipment or material necessitates revisions to the plans or involves other trades, include drawings and details showing all such changes, and coordinate and assume any liability from the affected trades.
  - 3. Acceptance: The acceptance of a manufacturer's name or product by the Contracting Officer does not relieve the Contractor of the responsibility for providing materials and equipment which comply in all details with the requirements of the contract documents.
- B. Tests: Demonstrate that all equipment operates as indicated as specified, and in accordance with the manufacturer's recommendations. Perform tests in the presence of the Contracting Officer. Provide all instruments and personnel required to conduct the tests.
- C. Qualifications: Use sufficient journeyman and competent supervisors in the execution of the work to ensure proper and adequate installation throughout. In the acceptance of installed work, no allowance will be made for lack of skill on the part of the workmen.

#### 1.3 WORK OF OTHER TRADES

- A. The Drawings do not show complete details of the building construction. Refer to the architectural, civil, and electrical Drawings for those details which may affect the execution of this work. Specific locations of structural or architectural features or equipment items, shall be obtained from field measurements or the trade providing the material or equipment. No extra payments will be allowed for failure to obtain this information.
- B. Coordination: Plan and execute work including, but not limited to, piping and ductwork, in cooperation with all other trades. Make every reasonable effort to provide all concerned with timely notice of work affecting other trades to prevent conflicts or interference as to space requirements, dimensions, openings, or other matters which will cause delays or necessitate work-around methods. Failure to coordinate work will be considered sufficient cause for work to be altered at Contractor's expense, as directed by Contracting Officer.

#### 1.4 EXISTING CONDITIONS

- A. Demolition work required is noted on the Drawings. Specific scope of demolition work and operating conditions to be encountered shall be verified from on-site review and coordination with the Contracting Officer. Maintain service to existing equipment and devices to be retained in area

adjacent to the existing areas scheduled for renovation. Provide temporary services as necessary to meet these conditions.

- B. Special Protection: Exercise maximum precaution to provide positive protection for the existing building and equipment from damage of any kind, and in particular prevent any water and dust seepage into the existing building.

#### 1.5 CODES

- A. Work and materials shall be in accordance with requirements of all applicable codes, regulations, and ordinances including, but not limited to, the following:
  - 1. Uniform Building Code, 1997 Edition.
  - 2. Uniform Mechanical Code, 1997 Edition.
  - 3. Uniform Plumbing Code, 1997 Edition.
- B. Codes shall be construed as establishing a minimum or base level, of requirements. Where provisions of the various codes standards conflict with each other, the more stringent provisions shall govern.
- C. Nothing in Drawings and specifications shall be construed to permit work not in conformance with these rules and regulations.
- D. Where Drawings or specifications call for material or construction of a better quality or larger sizes than required by the above-mentioned rules and regulations, the provisions of the Drawings or specifications shall take precedence over requirements of the rules and regulations.

#### 1.6 EQUIPMENT APPROVALS

- A. Whenever UL listed standards exist for equipment with electrical components, provide UL listed equipment. Otherwise provide equipment certified by the manufacturer as complying with UL standards for similar items.

#### 1.7 INTENT OF DRAWINGS

- A. Drawings are diagrammatic and show only approximate locations of piping, ducts, fixtures, and equipment. Take measurements from building or site and verify with architectural, structural, or electrical Drawings. Because of the small scale of the Drawings, it is not possible to indicate all offsets, fittings, and accessories that may be required. Carefully investigate the plumbing, electrical, structural, and finish conditions that would affect the work to be performed and arrange such work accordingly, furnishing required ductwork and piping offsets, fittings, and accessories to meet such conditions.
- B. It is the responsibility of the Contractor to provide equipment that fits into the space allotted and allows adequate acceptable clearances for installation, replacement, entry, servicing, and maintenance. When motors and equipment furnished are larger than sizes indicated, provide any required changes to the electrical services as may be necessary and related work as a part of the work for the section specifying that motor or equipment.
- C. Report any conflict to Contracting Officer prior to proceeding with the work. Failure to follow this instruction is considered sufficient cause to alter the work, at no cost to the Government, as directed by the Contracting Officer.

- D. Plans and sections generally do not show all isolating valves or other components; refer to diagrams to obtain a more complete description of systems.

#### 1.8 SUBMITTALS

- A. Comply with requirements of Section 01330 – Submittal Procedures.
- B. Submit shop drawings, descriptive bulletins, data sheets, diagrams, catalog cuts or other additional information as required for the items specified hereinafter in other sections.
- C. Acceptance: The acceptance of a manufacturer's name or product by the Contracting Officer does not relieve the Contractor of the responsibility for providing materials and equipment which comply in all details with the requirements of the contract documents.

#### 1.9 MATERIALS

- A. Quality: Materials, products, and equipment in strict accordance with governing codes and ordinances.
- B. Quantity: Equipment and items of any one classification which are used in quantity, such as accessories, valves, specialties, cleanouts, drains, fittings, fans, etc., shall be products of one manufacturer and shall be used only for services recommended by the manufacturer.

#### 1.10 ABBREVIATIONS, DEFINITIONS, AND REFERENCE STANDARDS

- A. Reference standards, definitions, and abbreviations are as follows:

AGA	American Gas Association
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
ARI	Air-Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
as shown	as shown on the Drawings
CISPI	Cast Iron Soil Pipe Institute
F	Degrees Fahrenheit
MSS	Manufacturer's Standardization Society
NEMA	National Electrical Manufacturer's Association
NEC	National Electrical Code
NFPA	National Fire Protection Association
provide	furnish and install
psig	pounds per square inch gage pressure
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
UL	Underwriters Laboratories, Inc.
v	Volts
wp	Working Pressure (psig)
wg	Water Gage

#### 1.11 OPERATION AND MAINTENANCE MANUALS

- A. Time of submittals, quantity of copies for submittals, binding, content, and other requirements shall be as specified in Section 01330 – Submittal Procedures.

- B. Prepare an operating and maintenance manual for all equipment provided under division 15 in accordance with Section 01330 – Submittal Procedures.

#### 1.12 RECORD DRAWINGS

- A. Furnish record drawings in conformance with the requirements of Section 01780 – Closeout Submittals.

#### 1.13 SITE CONDITIONS AND METHODS

- A. Cutting and Patching: Keep cutting and patching to a minimum. If required, all patching shall conform to specifications for the new general construction work. Finish to match existing work.
- B. Measurements: Verify space availability by field measurement prior to submitting shop drawings for approval.
- C. Roughing-In Dimensions: Obtain roughing-in dimensions for equipment from approved shop drawings or actual equipment measurements.
- D. Manufacturer's Installation Instructions: Follow manufacturer's written instructions where furnished. If the details are in conflict with design drawings, notify Contracting Officer for resolution.
- E. Accessibility: Install products which require periodic servicing or repair so that products readily accessible. Otherwise, obtain Contracting Officer's approval of location.
- F. Rejected Materials: Remove damaged or rejected materials from the site.
- G. Delivery, Storage, and Handling:
  - 1. Handle, store, and protect equipment and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations and as approved by the Contracting Officer. Replace damaged or defective items.
  - 2. Equipment with damaged factory applied finishes shall be refinished as required to bring the equipment to a like-new condition in accordance with manufacturer's recommendations.

#### 1.14 TESTING AND DEMONSTRATION

- A. Perform all hydrostatic tests required in codes and ordinances. Contracting Officer will be present during operational testing. Give sufficient notice before performing such tests.
- B. Systems Operation Demonstration: Subject systems to such operating tests as are required to demonstrate that the equipment installed will operate within the specified limits through normal ranges and sequences including simulation of possible abnormal conditions. Operate every device manually and automatically, in accordance with its purpose. Operating test duration; not less than 6 hours after all major corrections have been made. If tests do not demonstrate satisfactory system performance, correct deficiencies and retest systems.

#### 1.15 INSTRUCTION FOR GOVERNMENT 'S PERSONNEL

- A. Scope: Following initial operation of all mechanical equipment and prior to acceptance of the mechanical work conduct demonstrations of equipment operation and instruction periods for the Government's representatives during the time balancing work is being performed.

- B. Contractor's representatives, in general, who conduct these instructions and demonstrations shall be qualified foremen or superintendents acquainted with this project and from the trade involved. For major equipment, the representative shall be manufacturer's representatives with operating experience and substantial design experience on this project. Their qualifications shall be submitted to the Contracting Officer before conducting the instruction period.
- C. Representatives of Government who will be present at these meetings may include the Government's administrative, operating, and maintenance personnel.
- D. General Description of Instruction Period: Period shall include preliminary discussion and presentation of information from operation and maintenance manuals with appropriate references to Drawings, followed by tours of equipment spaces explaining maintenance requirements, access methods, servicing, and maintenance procedures, temperature settings, and available system and equipment adjustments.
- E. Duration of Instruction Periods:

Plumbing Systems	2 hours
Air Handling Systems	4 hours
- F. Scheduling of Instruction Periods: Notice of Contractor's readiness to conduct such instruction and demonstration periods shall be given to Contracting Officer at least 2 weeks prior to each instruction period and agreement reached on the date of each instruction period.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 15010

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## SECTION 15050 - BASIC MATERIALS AND METHODS

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. The work of this Section includes pipe identification, seismic restraints, and miscellaneous other basic materials.

#### 1.2 ALTERNATES

- A. Refer to Section 01230 – Alternates, for a description of work under this Section affected by alternates.

#### 1.3 SUBMITTALS

- A. Product Data:
  - 1. Hangers.
  - 2. Pipe markers.
- B. Certificates: Submit a certificate stamped and signed by a professional engineer licensed in the State of Montana stating that the seismic calculations for equipment have been completed and meet all requirements of the Uniform Building Code.

### PART 2 - PRODUCTS

#### 2.1 MISCELLANEOUS MATERIALS

- A. Anchor Bolts (Cast-In-Place): Galvanized steel bolts per ASTM A307 and galvanized steel nuts per ASTM A194. Number and size per manufacturer's recommendations or as shown. In concrete construction, provide bolts set in the form work before pouring concrete. In building floors where equipment bases are cast iron over 18 inches maximum dimension, provide a pipe sleeve around each bolt to allow for positioning.
- B. Support Channels: Unistrut, B-Line, or Powerstrut; 12 gauge minimum, 1-5/8 inch by 1-5/8 inch minimum cross-section size; galvanized finish unless indicated otherwise.
- C. Prefabricated Penetration Flashing Units: Portals Plus "Pipe Boots" or equivalent; EPDM or neoprene material.

### PART 3 - EXECUTION

#### 3.1 ANCHOR BOLTS

- A. Anchor Bolts (Cast-In-Place): Set anchor bolts in the form work before pouring concrete.

#### 3.2 FLASHING REQUIREMENTS

- A. Piping passing through roofs shall be installed through prefabricated penetration flashing units.

### 3.3 EQUIPMENT AND PIPING IDENTIFICATION

- A. Nameplates: Provide for each piece of new equipment including any special instruction for its use; laminated black and white plastic with lettering cut through to white background. Each equipment nameplate shall have equipment identification number.

### 3.4 EARTHWORK

- A. Provide as required for the installation of mechanical work in the ground as specified herein.
- B. Trench Excavation: Provide as necessary for the installation of the work, with trenches of the necessary width for proper laying of pipe, with banks as nearly vertical as possible. Accurately grade trench bottoms to provide uniform undisturbed bedding for each section of pipe along its entire length; form holes and depressions for joints after trench bottom has been graded. Provide temporary pumping equipment to keep the excavation free from water. Provide pipe bedding in rock excavation consisting of not less than 6 inches of sand or equivalent material.
- C. Bracing and Shoring: Provide as necessary to maintain stability of excavation.
- D. Backfilling: Backfill trenches only after completion of pressure tests and inspection by the Contracting Officer. Fill spaces between pipe and sides of trench by hand, shovel tamped in place; cover in 6-inch layers to thickness of 12 inches over top of pipe; fill and tamp remainder of backfill material in 6-inch layers. Provide backfill materials generally of clean earth or sand relatively free of clods or stones. For sewer and water piping, use pea gravel.
- E. Compacting: Perform compacting individually for each 6-inch layer (maximum) loose thickness of backfill. Compacting shall be suitable for installation of a concrete floor.
- F. Surplus Earth: Haul off site and dispose of legally.
- G. Clean-up: Leave premises thoroughly clean at completion.
- H. Underground warning tape shall be buried above the piping during the trench backfilling and shall be buried approximately 12 inches deep. Tape shall be 0.004-inch thick polyethylene tape for metallic pipe and polyethylene tape with metallic core for plastic pipe. Tape shall be 6 inches wide and be printed with repetitive caution warnings along its length. Tapes shall be yellow in color with black letters. Tape color and lettering shall not be affected by moisture or other substances contained in the backfill material.

### 3.5 EQUIPMENT, DUCTWORK, AND PIPING INSTALLATION

- A. Provide supports for equipment, piping, and appurtenances as required. All steel framework exposed to the weather shall be galvanized after fabrication.
- B. Manufacturer's Instructions: All equipment, including ductwork and piping appurtenances, shall be installed in strict accordance with manufacturer's instructions.
- C. Floor-Mounted Equipment, General:
  - 1. Provide machine and floor fastenings; set equipment on concrete pads. Provide equipment base drawings, bolt-setting information, and anchor bolts for all floor mounted equipment.

- 2. Install all equipment at the locations and to the dimensions indicated. Set equipment accurately with principal centerlines, and level using manufacturer's leveling screws, blocks, shims, or wedges. Do not distort equipment or baseplates.
  - D. Suspended Piping and Ductwork: Supporting elements shall be suitable for stresses imposed by systems, with a safety factor of not less than 5.0.
    - 1. Supporting elements not shown or specified shall be provided in accordance with SMACNA standards. Piping supports, not otherwise detailed, shall conform to applicable provisions of MSS SP-58 and MSS SP-69.
- 3.6 EQUIPMENT AND PIPING SEISMIC RESTRAINTS
- A. Piping shall be provided with seismic restraints in accordance with Seismic Hazard Level (SHL) B of the SMACNA Seismic Restraints Manual: Guidelines for Mechanical Systems dated 1998.
  - B. Furnaces, Water Heaters, and Condensers shall be seismically restrained to resist a lateral force acting in any direction in accordance with Uniform Building Code.

END OF SECTION 15050

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## SECTION 15060 - PIPE, VALVES, AND FITTINGS

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. Work Included: The work of this Section includes piping, valves, fittings, supports, hangers, and miscellaneous system accessories.

#### 1.2 SUBMITTALS

- A. Product Data: Manufacturer's data for each product used.
- B. Reports: Pressure tests.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. General: Pipe, fittings, and valves manufacturers listed below are acceptable.
- B. Steel Pipe: U.S. Steel, Laclede, Lone Star, Sawhill, Wheatland, or Sharon.
- C. Copper Tubing: Chase, Anaconda, Revere, Mueller, Reading Tube, or Bridgeport.
- D. Fittings: Nibco, Anaconda, Chase, Revere, Bridgeport, Grinnell, Grabler, Stockham, Walworth, Tube Forgings, Trinity, WeldBend, Crane, Bonney Forge, Wheatley, Metraflex, or Aeroquip.
- E. Valves: Apollo, Crane, Centerline, Jenkins, Walworth, Kennedy, Hammond, Stockham, Grinnell, Nibco, Milwaukee Powell, Dezurick, Homestead, Watts Regulator, Rockwell-McCanna, Kitz, Red-White, Wheatley, Worcester, or Mueller.

#### 2.2 STEEL PIPING - GENERAL

- A. Pressure Ratings: Provide pipe, fittings, accessories, and other components with minimum pressure rating of 150 psig.
- B. Pipe: Black steel, ASTM A 53, Grade A or B, electric resistance welded or seamless, standard weight unless otherwise noted.
- C. Fittings: 150 psig threaded black malleable iron, ANSI/ASME B16.3 and ASTM A197.
- D. Unions: ASME B16.39 150 psig black malleable iron, screwed, ASTM A 197, brass seat.
- E. Joint Compound: Teflon tape.
- F. Ball Valves: Apollo 70-100 or 70-200 Series, 600 psig WOG bronze or brass body, chrome plated brass ball and brass stem, screwed, Teflon seat and seal. Provide stem extension for use in insulated piping.

## 2.3 COPPER PIPING - GENERAL

- A. Pressure Ratings: Provide pipe, tubing, fittings, accessories, and other components with minimum pressure rating of 150 psig.
- B. Tubing (Pipe), Above Ground: ASTM B88 Type L copper water tube, hard drawn.
- C. Fittings:
  - 1. Wrought copper solder fittings and screwed adapters, ANSI B16.22.
  - 2. Cast bronze solder joint fittings and screwed adapters, ANSI B16.18.
- D. Unions:
  - 1. Wrought copper solder joint unions, ANSI B16.22.
  - 2. Cast bronze solder joint fittings, ANSI B16.18.
- E. Threaded Joint Compound: Teflon tape.
- F. Solder: 95 percent tin, 5 percent antimony solder, ASTM B 32 Harris "Bridgit" acceptable. Laco flux or similar not permitted.
- G. Brazing Alloy: Melting temperature 1000 degrees F or higher; AWS A5.8.
- H. Ball Valves: Apollo 70-100 or 70-200 Series, 600 psig WOG bronze body, stainless steel ball and stem, solder ends or screwed, Teflon seat and seal. Provide stem extension for use in insulated piping.

## 2.4 DIELECTRIC UNIONS

- A. Provide at each joint between dissimilar metals.
  - 1. 2 Inches and Smaller: Dielectric unions rated at 250 psig at 180 degrees F conforming to ANSI B16.39.
  - 2. Manufacturer: Watts 3000 Series, Epco, Perfection Corp. Dielectric Waterways, or equivalent.

## 2.5 ESCUTCHEONS

- A. Chrome-plated; provide spring clip type at ceilings.
- B. Provide 2-inch deep escutcheons for lavatory drains where required.
- C. Manufacturer: Pasco Manufacturing or equivalent.

## 2.6 PIPE HANGER STRAPS

- A. Material: Galvanized Steel, 3/4" wide except if direct contact with copper pipe use copper glad, 3/4" wide.
- B. Hanger Selection:
  - 1. Bare Pipe: Fit outside diameter of pipe.
  - 2. Insulated Pipe: Fit outside diameter of insert and provide galvanized steel protection shield.
- C. Ring Hangers:

1. 2-Inch Pipe and Smaller: Grinnell Figure 70, or 104.
2. 2-1/2 Inches to 8 Inches: Grinnell Figure 104 or 300.

## 2.7 PIPE SUPPORTS

- A. Provide pipe support system including straps, clip brackets and bushings for domestic cold water and domestic hot water piping installed within stud walls at plumbing fixture services.
  1. Manufacturer: Ruffin by B-Line Systems, or equal.
  2. Metal Components: Pregalvanized steel ASTM A446 Grade A or better. Metal parts in contact with copper pipe shall be copper plated steel ASTM A611 Grade C or better.
  3. Plastic Components: Polypropylene or Lexan 141 with flame retardant rating UL 94Y2 or better.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Diagrams: Diagrams showing pipe connections are schematic only. Do not use for calculating lineal runs or numbers and types of fittings.
- B. Connections to Equipment: Provide unions to allow local disassembly.

### 3.2 INSTALLATION OF PIPING AND VALVES

- A. General:
  1. Install piping promptly, capping or plugging all open ends and making pipe generally level and plumb, free from traps, and in a manner to conserve space for other work.
  2. Inspect each piece of pipe, tubing, fittings, and equipment for defects and obstructions; promptly remove all defective material from the jobsite.
  3. Install pipes to clear all beams and obstructions; do not cut into or reduce the size of load carrying members.
  4. Use long radius elbows wherever possible.
  5. Install all piping in accordance with ASME B31.9 "Building Services Piping" and as specified herein.
- B. Location of Pipe: Piping layout as shown is diagrammatic indicating general arrangement. Determine measurements at jobsite, accurately cutting pipe to suit. Locate piping to avoid interference with building structural members, equipment, and building openings; provide access for operation, service, disconnection, removal and replacement of valves, fixtures, and equipment. Within buildings, conceal all piping in walls and above ceiling except where indicated to remain exposed.
- C. Cleaning: Clean interior of piping before making joints and placing in position by blowing clean with compressed air. Maintain cleanliness of piping throughout installation; provide caps or plugs on open ends of cleaned piping.
- D. Unions and Fittings: Provide unions at valves, fixtures, and equipment if a means of disconnection is not otherwise provided. Provide reducing fittings for all changes in pipe size; bushings are not acceptable. Use fittings for all changes in direction of piping.
- E. Routing: Run parallel to column lines and perpendicular to the floor unless shown otherwise on Drawings.

- F. Leaks: Correct immediately, using new materials; leak-sealing compounds not permitted.
- G. Concealed Piping: Install piping as concealed work in finished areas, unless indicated otherwise. Do not cover up or enclose work until properly and completely inspected and reviewed. Should work be covered up or enclosed prior to inspections and reviews, uncover work as required and, after completely inspected and reviewed, make repairs and replacements with materials as necessary and at no additional cost to the Government.
- H. Dielectric Unions: Provide dielectric unions at each joint between dissimilar metals, except that bronze valves and fittings may be used without dielectric couplings for ferrous-to-ferrous or non-ferrous-to-non-ferrous connections.

### 3.3 PIPE HANGERS AND SUPPORTS

- A. Provide all hangers, supports, and mounting accessories for piping and equipment.
- B. Minimum Spacing of Horizontal Pipe Hangers:
  - 1. Comply with the spacing requirements of MSS Standard SP-69.
  - 2. Provide additional supports at concentrated loads, such as valves and similar items. Provide minimum of one hanger per section of soil, waste, and drainage piping.
- C. Vertical Piping: Route vertical piping in a manner such that it can be attached to adjacent walls or columns.
- D. Piping: Suspend piping using steel rod hangers, with individual rods for each hanger.
- E. Piping Supports:
  - 1. Support all piping to route expansion and contraction in the required direction.
  - 2. Use hangers for supporting pipe 2 inches and larger that are fabricated to permit adjustment after erection while still supporting its load.
  - 3. Use wall brackets where pipes are adjacent to walls or other vertical surfaces which may be used for support.
  - 4. Install supports to adequately carry the load and still maintain proper alignment.

### 3.4 INSULATION INSERTS

- A. Insulated Piping: Provide factory fabricated insulation inserts with split metal jacket. Install inserts prior to installing insulation. Inserts for piping at pipe clamps on formed steel channels shall be 360 degree inserts covering the complete circumference of the pipe.

### 3.5 JOINTS

- A. Screwed:
  - 1. Produce sufficient lengths of perfect threads to ensure full metal-to-metal contacts when screwed in fittings; countersink, ream and clean ends of pipes of chips and burrs after threading.
  - 2. Make up full connections with not more than one full thread exposed, by such method that will not subject pipes or fittings to twisting or cross strains; lubricate male threads only with joint compound.
- B. Brazed and Soldered: Cut ends square and remove all fins and burrs. Replace all dents and damaged tubing with new tubing. Remove all grease and oil from all joints by wiping with clean cloth saturated with a suitable chemical solvent and then clean with emery cloth. After cleaning

apply non-corrosive flux, apply heat and solder and hold joint rigidly until solder has hardened. Wipe excess solder from exterior of joint before hardening. Before soldering, remove stems and washers of solder joint valves.

### 3.6 ESCUTCHEON PLATES

- A. Provide where exposed piping passes through walls, floors, and ceilings of finished rooms.

### 3.7 TESTING OF NEW PIPING

- A. General:
  - 1. Test new piping. Test after the lines have been cleaned and prior to insulation.
  - 2. Isolate from existing systems by the closest valve or valves to the existing system.
  - 3. Furnish test equipment. Install a calibrated test pressure gage in the piping being tested.
  - 4. Prior to testing, remove or valve-off gages, traps, and other apparatus which may be damaged by testing.
  - 5. Make test in presence of the Contracting Officer.
  - 6. Rectify all defects which develop during testing and retest until approved by the Contracting Officer.
  - 7. Provide vents and drain valves as required to drain piping after testing.
- B. Test Requirements: Follow test requirements unless requirements are specified in individual specification Sections. Submit a report indicating results of all pressure tests.
  - 1. Pressure: 1-1/2 times design working pressure or 150 psig, whichever is greater.
  - 2. Time: Hold pressure to inspect all joints and connections.
  - 3. Test all joints in air-tested systems by brushing with a soapy water solution.
  - 4. Water test all piping except natural gas and refrigerant piping with water less than 100 degrees F.
  - 5. Natural gas piping test requirements are specified in Section 15400.
  - 6. Refrigerant piping test requirements are specified in Section 15780.

END OF SECTION 15060

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## SECTION 15250 - MECHANICAL INSULATION

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. Work Included: The work of this Section includes insulation and accessories for piping systems and air distribution systems.

#### 1.2 SUBMITTALS

- A. Product Data: All materials.

#### 1.3 QUALITY ASSURANCE

- A. Fire Resistance:
  - 1. Insulation: Flame spread and smoke-developed ratings per NFPA 255, ASTM E84, and UL 723 testing requirements; not more than 25/50.
  - 2. Tape, Adhesives, Vapor Barrier Materials, and Jackets: Flame spread ratings not to exceed 25.
  - 3. Exempt Items/Materials: The following are exempt from the fire resistance ratings:
    - a. PVC jacket covers.

#### 1.4 DEFINITIONS

- A. Thickness: Normal thickness of insulation is defined as the thickness of the basic insulating medium not including finishing coats.
- B. Exposed Versus Concealed Insulation:
  - 1. Exposed is defined as work exposed to the view of occupants in normally occupied areas and in equipment rooms.
  - 2. Concealed is defined as work located in ceiling spaces, chases, crawl spaces, and other locations not exposed to view.
- C. Thermal Conductivity is defined as Btu-inch/hour-square feet-degrees F.
- D. Cold Piping: Domestic cold water and refrigerant vapor.

### PART 2 - PRODUCTS

#### 2.1 INSULATION CHARACTERISTICS

- A. Manufacturer: Owens-Corning, Certainteed, Johns Manville, Armstrong, or Knauf.
- B. Pipe Insulation:
  - 1. Fiberglass: Suitable for pipe temperature from 0 degrees F to plus 800 degrees F; one piece type with only one longitudinal joint; thermal conductivity not greater than 0.24 at 75 degrees F mean temperature. Provide factory applied all-service jacket.
    - a. Factory Applied All-service Jacket for Fiberglass Insulation: White kraft paper outer surface bonded to aluminum foil vapor barrier, suitable for painting. Kraft paper permanently treated for fire and smoke safety and to prevent corrosion of the foil. Factory applied pressure sensitive closure system for permanent seal of laps and butt strips.

2. Closed Cell Elastomeric: Suitable for pipe temperature from minus 40 degrees F to plus 220 degrees F; one piece type with only one longitudinal joint; thermal conductivity not greater than 0.27 at 75 degrees F mean temperature. Factory applied all-service jacket not required.
- C. Insulation For Valves, Fittings, and Unions:
  1. Fiberglass: Owens-Corning Type TIW wool type wrap, Johns Manville HTB 26 insulation blanket, or resilient glass fiber strips to same thickness of adjacent piping insulation. Provide with PVC covers.
    - a. PVC Covers: Factory premolded one-piece PVC covers.
  2. Closed Cell Elastomeric: Same as specified for pipe.
- D. Ductwork Insulation:
  1. Concealed Ductwork and Plenums: Flexible blanket with foil-scrim-kraft facing; density of 1.5 pounds per cubic foot; thermal conductivity not greater than 0.25 at a mean temperature of 75 degrees F; 1 inch thick unless specified or shown otherwise.
  2. Exposed Rectangular Ductwork and Plenums: Fiberglass rigid insulation with foil-skrim-kraft facing; density of 3 pounds per cubic foot; thermal conductivity not greater than 0.24 at a mean temperature of 75 degrees F; 3 inch thick unless specified or shown otherwise.
  3. Exposed Round Ductwork: Same as specified for glass fiber pipe insulation with all service jacket; 3 inch thick.

## 2.2 METAL JACKETS

- A. Metal Jackets: 0.016 thick stucco embossed aluminum with integral vapor barrier. Provide self-sealing, watertight aluminum bands for butt joints.
  1. Metal jackets shall be factory premolded wherever possible.

## 2.3 INSULATION SPECIALTIES

- A. Joint Tape: Glass fiber reinforced, aluminum foil and kraft paper laminate with vapor barrier characteristics comparable to insulation facing.
- B. Finishing Cement: Hydraulic setting, low shrinkage insulating and finishing cement for one coat finish, suitable for painting with water base paint, Johns Manville No. 375 or approved.
- C. Insulating Cement: Mineral fiber cement suitable for application on metal in single layers up to 4-inch thick, Johns Manville No. 460 Cement or approved.
- D. Vapor Barrier Adhesive: Vapor barrier lap sealing adhesive, Foster 85-20 or approved.
- E. Lagging Adhesive: Foster 30-36, Miracle LA69, Arabol, or approved.
- F. Vapor Barrier Coating: Foster 30-80 water based vapor barrier coating or equivalent.
- G. Aluminum Pigmented Vapor Barrier Mastic: Foster 60-65 or approved.
- H. Insulation Pin Fasteners: Zinc-coated steel, 2 inch by 2 inch perforated plate with spindle and washer. Spindle length to suit insulation thickness.
- I. Insulation Pin Adhesive: Contact cement suitable for fastening insulation pins to metal surfaces, Miracle Adhesive HT4620, Foster 82-11, Tuf-Bond all-purpose or approved.

- J. Mastic: Foster CI oil base or HI water base.
- K. Inserts: Specified under Section 15060.
- L. Insulation Bands: 3/4-inch wide, 0.02-inch galvanized or stainless steel.
- M. Wire: Soft annealed stainless steel, 047-inch diameter.

### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. Insulate surfaces of hot and cold piping and piping components.
- B. Install with all joints tightly butted. Tuck and tuft all edges of insulation. Maintain vapor barrier when butting insulation to inserts.
- C. Install insulation to allow easy access to equipment for inspection and repairs.
- D. Remove all loose dirt, rust, all other loose foreign material, moisture and frost from surfaces prior to installing insulation.
- E. Do not insulate ductwork upstream of air terminal units until pressure tests are completed.
- F. Apply insulation only after piping has been tested.

#### 3.2 INSTALLATION (PIPING)

- A. General:
  - 1. Provide all insulation continuous through wall and floor openings.
  - 2. In order to prevent condensation formation under normal operation, apply insulation with a continuous, unbroken vapor seal throughout each entire cold piping system. Refer to definition of cold piping in Part 1 of this Section. Adequately insulate and vapor seal hangers and supports that are secured directly to cold surfaces to prevent condensation.
  - 3. Apply specific adhesives, mastics, and coatings at the manufacturer's recommended minimum coverage per gallon.
  - 4. Inserts: Overlap adjacent insulation jacket a minimum of 1 inch on insulation inserts and securely cement in place.
- B. Fiberglass Insulation:
  - 1. Fiberglass Insulation For Pipes: Apply insulation over clean, dry pipe with all joints butted firmly together. Smoothly secure longitudinal jacket laps and butt strips according to manufacturer's recommendations.
  - 2. Fiberglass Insulation For Valves, Fittings, and Unions: Apply insulation and install PVC covers. Staple and seal all seam edges of the one-piece PVC cover with vapor-barrier adhesive applied over insulation. Tape circumferential edges of cover with vapor barrier pressure sensitive tape to match fitting cover color. The tape shall extend over the adjacent piping insulation and have an overlap on itself at least 2 inches.
    - a. Unions: Each union shall have a separate PVC fitting cover. Write the word "UNION" on each PVC union cover with a permanent black felt marking pen.

C. Elastomeric Insulation:

1. Insulation shall be slipped on the pipe prior to connection wherever possible, and the butt joints shall be sealed with adhesive. Where the slip-on technique is not possible, the insulation shall be slit and snapped over the pipe, and the seams and butt joints sealed with adhesive.
2. Fitting insulation shall be fabricated and installed according to the manufacturer's recommended procedures. Sweat fittings shall be insulated with miter-cut pieces of pipe insulation the same size as on adjacent piping. All joints and miter-cut pieces are to be sealed with adhesive.
3. At outside-carrying hanger locations, where the insulation must resist compression, supporting devices such as short wood dowels or woodblocks shall be used in combination with galvanized sheet metal hanger shields. The wood supporting devices shall be the same thickness as the insulation and sealed into the insulation with adhesive.

3.3 INSTALLATION (DUCTWORK)

- A. Flexible Insulation: Apply to ductwork with Foster 85-20 mastic applied in 4-inch wide strips on 12-inch centers; secure with edges tightly stitched with staples. Insulate on the bottom of rectangular horizontal ducts over 24 inches wide by impaling over pins in addition to mastic; locate pins not more than 3 inches from the edge of insulation pieces and spaced not more than 12 inches on centers; sagging of flexible duct insulation will not be permitted. Seal all punctures and voids with vapor barrier.

1. Seal seams with 4-inch wide pressure sensitive vapor barrier tape to match insulation facing.

- B. Rigid Insulation: Secure to ductwork by impaling over pins located not more than 3 inches from the edge of insulation pieces and spaced not more than 12 inches on center. Apply insulation with all joints tightly butted. Fill all joints, breaks, punctures and voids with vapor barrier mastic and cover with tape to match insulation facing.

1. Seal seams with 4-inch wide pressure sensitive vapor barrier tape to match insulation facing.

- C. Exposed Round Ductwork: Apply the same as specified for glass fiber pipe insulation.

3.4 INSTALLATION (METAL JACKETS)

- A. Provide metal jacket on insulated piping and piping components located outside.

- B. Overlap circumferential and longitudinal joints at least 1 inch and arrange to shed rain. Seal overlapped joints with aluminum pigmented vapor barrier mastic. Secure with metal bands of the same material as the jacket.

3.5 ITEMS TO BE INSULATED

A. Piping:

1. New Cold Piping:
  - a. Domestic cold water piping that is located in the crawl space.
  - b. Refrigerant vapor piping.
2. New Hot Piping:
  - a. Domestic hot water piping.

B. HVAC Systems:

1. New supply air ductwork and plenums that are located in the crawl space.

2. New round outside air intake ductwork between the intake hood and the volume damper upstream of the furnace.

### 3.6 ITEMS NOT TO BE INSULATED

- A. Piping: Valve stems.

### 3.7 INSULATION TYPE AND THICKNESS

- A. Pipe: Insulate piping to the thickness listed in the following table.

Service	Type	Insulation Thickness
Domestic Cold Water	FG	1"
Domestic Hot Water In Crawl Space	FG	1.5"
Domestic Hot Water Not In Crawl Space	FG	1"
Refrigerant Vapor Piping	E	1"

- B. Abbreviations:
  1. FG - Fiberglass.
  2. E - Elastomeric.

END OF SECTION 15250

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## SECTION 15400 - PLUMBING

### PART 1 - GENERAL

#### 1.1 WORK INCLUDED

- A. The work of this Section includes drainage piping, vent piping, domestic cold water piping, domestic hot water piping, natural gas piping, plumbing fixtures, pumps, drains, and piping specialties and accessories.

#### 1.2 CODES

- A. Provide all plumbing work in conformance with the Uniform Plumbing Code and local Amendments.

#### 1.3 SUBMITTALS

- A. Product data for the following:
  - 1. Drains.
  - 2. Pipe, valves, and fittings.
  - 3. Pipe specialties and accessories.
  - 4. Plumbing fixtures and trim.
  - 5. Pumps.

### PART 2 - PRODUCTS

#### 2.1 DOMESTIC COLD WATER AND DOMESTIC HOT WATER PIPING

- A. Domestic Cold Water and Domestic Hot Piping (Above Ground):
  - 1. Pipe, Fittings, and Valves: Piping shall be copper. Conform to requirements of Section 15060.
  - 2. Provide chrome-plated construction for all exposed pipe, fittings, and valves.
- B. Domestic Water Piping (Underground Or Embedded in Concrete Up To Fitting at Connection To The Above Ground Water Piping):
  - 1. Type K copper tubing, soft drawn, ASTM B88.
  - 2. Fittings: Wrought copper solder joint, ANSI B16.22; cast bronze solder joint, ANSI B16.18.
  - 3. Brazing: Brazing alloy with melting temperature 1000 degrees F or higher, AWS A5.8.

#### 2.2 NATURAL GAS PIPING

- A. Natural Gas Piping (Above Ground) and Natural Gas Vent Piping: Conform to the requirements of "Steel Piping - General" in Section 15060 with the following exceptions.
  - 1. Pipe:
    - a. 3/4 Inch and Smaller: Seamless Schedule 80 ASTM A106 Grade B steel piping.
    - b. One Inch and Larger: Seamless or electric resistance welded standard weight ASTM A53 Grade B steel piping.
  - 2. Fittings:
    - a. 2 Inch and Smaller: Threaded 150 psig malleable iron, ANSI B16.3 and ASTM A197.

3. Ball Valves: UL listed as a natural gas shut off valve; Apollo 81-100 Series one piece bronze ball valve; threaded end connections; 250 psig rating; TFE seats and seals.
  - a. Provide valve with pad-locking device where indicated on Drawings.

## 2.3 DRAINAGE AND VENT PIPING

- A. Sanitary Soil, Waste, and Vent Piping:
  1. Above Ground: Polyvinyl chloride (PVC) pipe and DWV fittings conforming to ASTM D2665; joined with solvent cement.
  2. Underground:
    - a. Standard weight bell and spigot cast iron pipe per ASTM A47, with neoprene compression seal; long pattern cast iron drainage fittings.
    - b. Standard weight hubless cast iron and pipe fittings per CISPI 301; long pattern cast iron drainage fittings. Coupling shall be Clamp-All "Hi-TORQ 125"; 0.024 inch thick Type 304 stainless steel housing with neoprene rubber sleeve gasket and Type 304 stainless steel clamps.
- B. Indirect Waste:
  1. Copper Drainage Tube: Type DWV, ASTM B306.
  2. Fittings:
    - a. Type DWV wrought copper drainage fittings, ANSI B16.29.
    - b. Type DWV cast bronze drainage fittings, ANSI B16.23.
- C. Pump Discharge Piping and Valves: This includes the discharge piping from the foundation drainage pumps.
  1. Above Ground Pipe and Fittings: Standard weight ASTM A53 galvanized steel pipe with threaded galvanized steel fittings.
  2. Underground Pipe and Fittings: Type K copper pipe with cast bronze or wrought copper fittings. Braze joints with brazing alloy that has a melting temperature 1000 degrees F or higher, AWS A5.8.
  3. Ball Valves: As specified in Section 15060.
  4. Check Valves: Check valve shall be a lever and spring type, with rubber seated swing check disc. The valve shall permit flow in one direction only and close tightly when discharge pressure exceeds inlet pressure. The valve body and self-aligning disc shall be of cast iron. The shaft shall be of stainless steel.

## 2.4 PIPING SPECIALTIES AND ACCESSORIES

- A. Acceptable Manufacturers: Jay R. Smith, Josam, Wade, Zurn, Jones, Mifab, Watts, Ancon, Woodford, Sioux Chief, Precision Plumbing Products or as specified.
- B. Floor Cleanouts: Jay R. Smith Figure 4020, or equivalent, cast iron body and frame, round adjustable secured nickel bronze top, bronze plug. Provide carpet clamping top where required.
- C. Flashings: Refer to Section 15050.
- D. Automatic Trap Primers: Precision Plumbing Products P/N-PO-500 with DV-2 distribution unit where required, or equivalent of Mifab; 1/2-inch connection, air gap type.
- E. Water Hammer Arresters: Jay R. Smith Models 5005 to 5050 or equivalent; in-line, factory-sealed shock arresters with screwed connections; shall meet PDI Standard WH-201.

- F. Dielectric Unions:
  - 1. 2 Inches and Smaller: Dielectric unions rated at 250 psig at 180 F conforming to ANSI B16.39.
  - 2. 2-1/2 Inches and Larger: Dielectric flange fittings conforming to ANSI B16.42 (iron) or ANSI B16.24 (bronze).
  - 3. Manufacturer: Watts 3000 Series, Epco, Perfection Corp. Dielectric Waterways or equivalent.

## 2.5 DRAINS

- A. Manufacturer: Jay R. Smith, Josam, Zurn, Ancon, Jones, Watts, or Wade unless specified otherwise.
- B. Catalog Numbers: Catalog numbers of one or more manufacturers describe exact drain required.
- C. Connection for Trap Priming: Provide a trap primer connection for floor drains that are indicated on Drawings to be primed.
- D. Floor Drain Type FD-A: Jay R. Smith figure 2010; enamel coated cast iron body and flashing collar with 8 inch diameter cast iron bar grate.

## 2.6 VENTS FOR GAS FIRED WATER HEATERS

- A. Type B Gas Vent System:
  - 1. UL listed double-wall type B vent system with galvanized steel outer wall and aluminum alloy inner pipe; complete with tees, elbows, and supports as required.
  - 2. Manufacturer: Metalbestos, AMPCO, or Metal-Fab.

## 2.7 FOUNDATION DRAINAGE PUMPS AND BASINS

- A. Pump: Liberty Pumps Model "257 VMF" simplex submersible sump pump suitable for handling 1/2 inch solids or approved equal. Pump shall have a one piece cast iron housing with support legs; epoxy powder coat finish; vortex style impellers constructed of high temperature engineering polymer; hermetically sealed motor and switch cavities and permanently lubricated bearings; thermal overload protection; carbon and ceramic shaft seal; quick disconnect power cord with length as required to reach electrical receptacle; non-corrosive stainless steel fasteners; Type 416 stainless steel rotor shaft. Provide pump with a vertical magnetic float switch.
- B. Sump Basin: Liberty Pumps Model "SP1824" sump basin or approved equal; 24 gallon capacity; constructed of high density polyethylene; with openings as shown on Drawings.
  - 1. Sump Cover: Liberty Pumps Model "SC1801" sump cover or approved equal; constructed of high density polyethylene; slotted opening for submersible pump; and with openings as shown on Drawings.

## 2.8 PLUMBING FIXTURE TRIM

- A. Trim is defined as any metal part used with a fixture; i.e., faucets, drains, traps, and supplies.
- B. Exposed metal parts shall be chrome plated except where specified as stainless steel.

- C. Stops: Loose key pattern with shield, have a polished finish where exposed and rough where concealed; Bridgeport Brass, Brass Craft (Speedway), Teledyne Ansonia, or equivalent. Provide stops in each water connection to each fixture, except where a fitting has integral stops.
- D. Exposed Supplies: 3/8 inch outside diameter chrome plated tubing.
- E. Traps: Chrome plated 17 gauge copper alloy, adjustable, with cleanout. Provide for all lavatories and counter sinks.
- F. Provide escutcheons per requirements of Section 15060 at each point where pipe or other fittings enter wall at fixture.
- G. Provide vacuum breaker, with a flow-through pattern, on the water supply to each fixture which has a water connection located below the rim, or a hose attachment.

## 2.9 PLUMBING FIXTURE SCHEDULE

- A. General:
  - 1. Vitreous China Fixtures: Catalog numbers are American Standard; equivalent of Kohler, Eljer, or Crane are acceptable.
  - 2. Stainless Steel Sinks: Catalog numbers are Just; equivalent of Elkay or Aristaline are acceptable.
  - 3. Faucets: Catalog numbers are Chicago Faucets; equivalent of T & S Brass and Bronze Works is acceptable.
  - 4. Shower Valves: Catalog numbers are Symmons; equivalent of Powers or Leonard are acceptable.
  - 5. Color of Vitreous China Plumbing Fixtures: White.
- B. Counter Mounted Lavatory (P1-1): American Standard "Aqualyn" No. 0475.047; ADA compliant; vitreous china, oval, self-rimming, countertop lavatory with front overflow and a faucet ledge drilled for 1 center hole; 20-3/8 inch by 17 inch size.
  - 1. Faucet: Chicago Faucets "Marathon" Model 2201 single control faucet with pop-up drain, soft closing valve, 4-3/4 inch spout, and modified to be furnished with a No. E2605 0.5 gpm outlet; ADA compliant.
- C. Floor Mounted Water Closets (P2-1): American Standard "Colony" No. 2199.017; 1.6 gallons per flush; vitreous china; elongated siphon action bowl; close coupled tank, Aquameter water control; and left hand chrome plated trip lever.
  - 1. Closet Seat: White, closed front, elongated with cover; Church No. 380TL or approved equal of Sperzel, Olsonite, or Beneke.
- D. Double Compartment Counter Mounted Sinks (P3-1): Just Model No. DL-1933-A-GR double compartment counter mounted sink; 20 gauge, Type 304 or 302 stainless steel; self-rimming, integral flange and ledge; with 1-hole drilling centered between compartments for faucet, 1 hole offset to the left for a dishwasher air gap fitting, and 1 hole offset to the right for a hose spray; overall dimensions of 19 inches front to back by 33 inches left to right by 7 inches deep; inside dimensions of each compartment of 14 inches front to back by 14 inches left to right by 7 inches deep; underside of sink shall be sound deadened.
  - 1. Faucet: Chicago Faucets "Marathon" Model 2301 single control faucet with diverter hose and spray, soft closing valve, 10 inch spout, and a No. E12 two gpm aerator; ADA compliant.
  - 2. Drain: Just Model No. J-35-SSF Type 304 stainless steel perforated grid strainer and 1-1/2 inch diameter tailpiece.

3. Garbage Disposal: In-Sink-Erator Model 77; continuous feed, automatic reversing action; 3/4 horsepower split phase motor, corrosion protection shield, stainless steel lugs.
  4. Dishwasher Air Gap Fitting: Brasscraft, Bristol Corporation, or Moen; ASSE 1021, plastic body, chrome plated brass cover, rated for 5 psi at 140 degrees F and 5 gpm minimum.
  5. Dishwasher Hose: Rubber hose suitable for dishwasher drain; length as required for connection to dishwasher.
- E. Tub Bath and Shower (P4-1):
1. Tub and Shower: Aqua Glass Model 626034B acrylic tub/shower unit or approved equal; white in color; unit construction shall be of molded, reinforced fiberglass with a cellular inner core and a reinforced fiberglass outer protective coating; finished surface shall be of a sanitary-grade methyl-acrylate (acrylic); flame spread rating of less than 200 as tested to ASTM E-162 and shall achieve a flame spread index rating of "C"; unit shall comply with HUD UM Bulletin 73A and have a smoke generated rating of less than 450. Unit shall be provided with 3 molded in soap/shampoo shelves and a textured floor. Rough-in dimensions shall be 60 inches wide by 33-1/4 inches deep by 84 inches high. Furnish with a 1 inch outside diameter Type 304 stainless steel curtain rod and a white commercial grade vinyl shower curtain. Provide left or right handed valve wall as shown on Drawings.
  2. Mixing Valve, Shower Head, and Diverter Tub Spout: Symmons 1-215-X; pressure balancing mixing valve with integral stops and adjustable stop screw to limit handle turn; Super shower head with arm and flange, 2.5 gpm flow control; diverter tub spout with twin ell; chrome plated finish.
  3. Drain: Kohler "Clearflow" No. K-7160-TF-CP adjustable pop-up drain or approved equal; polished chrome finish.
- F. Shower (P4-2):
1. Shower Stall: Aqua Glass Model 913636AC "DuraTile Series" shower unit or approved equal; white in color; unit construction shall be of molded reinforced fiberglass with a cellular inner core and a reinforced fiberglass outer protective coating; finished surface shall be of a sanitary-grade polyester gelcoat; flame spread index rating of less than 75 as tested to ASTM E-84 and shall achieve a flame spread rating of "B"; unit shall comply with HUD UM Bulletin 73A and have a smoke generated rating of less than 450. Unit shall have a center drain and textured base. Rough-in dimensions shall be 36 inches wide by 36 inches deep by 75-3/4 inches high. Furnish with a 1 inch outside diameter Type 304 stainless steel curtain rod and a white commercial grade vinyl shower curtain.
  2. Shower Head and Mixing Valve: Symmons 1-100-X; pressure balancing mixing valve with integral stops and adjustable stop screw to limit handle turn; Super shower head with arm and flange; 2.5 gpm flow control; chrome plated finish.
- G. Recessed Wall Mounted Washer Service Box For Clothes Washer (P5-1): Guy Gray Model No. B200 or approved equal; for 2 inch drain pipe and for bottom supply with 2 hose end quarter turn ball valves; 20 gauge box and 18 gauge faceplate made of G90 hot dipped galvanized steel.
- H. Recessed Wall Mounted Water Outlet Box For Refrigerator (P5-2): Guy Gray Model No. BIM875 or approved equal; for bottom supply with one compression outlet quarter turn ball valve; 20 gauge box and 18 gauge faceplate made of G90 hot dipped galvanized steel.
- I. Wall Hydrants (P6-1): Jay R. Smith Figure 5509QT or approved equal; bronze nickel plated quarter turn non-freeze hydrant with hose connection, integral vacuum breaker. "T" handle key, and stainless steel box with full 180 degree cover opening. Hydrant shall meet ANSI A112.21.3 specifications.

### PART 3 - EXECUTION

### 3.1 GENERAL

- A. Inspection:
  - 1. Carefully inspect installed work of other trades and verify that such work is complete to the point where this installation may properly commence.
  - 2. Verify that plumbing is installed in accordance with pertinent codes, regulations, and Drawings.
- B. Discrepancies: In the event of discrepancy, immediately notify the Contracting Officer; do not proceed with installation until discrepancies have been resolved.

### 3.2 INSTALLATION OF BUILDING PIPING AND EQUIPMENT

- A. General: Install piping and equipment in accordance with Section 15060 and as follows.
  - 1. Install piping promptly, capping or plugging open ends and in a manner to conserve space for other work.
  - 2. Unless otherwise indicated, provide uniform pitch of at least 1/4 inch per foot for horizontal waste and soil piping within building.
  - 3. Support all piping independently from connected equipment.
  - 4. Inspect each piece of pipe, fitting, and equipment for defects and obstructions; promptly remove defective material from job site.
  - 5. Install pipes to clear beams and obstructions; do not cut into or reduce size of load carrying members without the approval of the Contracting Officer.
  - 6. Water Hammer Arrestors: Install sizes selected from manufacturer's tables to match branch pipe size, fixture units of attached fixtures and equipment, and to suit system pressure at point of installation. Placement and connections shall be per PDI Standard WH-201, with the exception that a water hammer arrestor is not required on a branch line which has only a single fixture unless there is a line mounted water solenoid valve in the branch line. Install in an upright position and in an accessible location.
  - 7. Automatic Trap Primers: Provide trap primers where drains are indicated to be primed and where required by the plumbing code. Connect primer line on the top of a horizontal cold water line and install trap primer valve and distribution unit in an accessible location.
  - 8. Provide unions for all equipment requiring disconnection for service including, but not limited to, the following.
    - a. Discharge of relief valves.
    - b. Inlet and outlet of trap primers.
  - 9. Dielectric Fittings: Provide dielectric fitting at each joint between dissimilar metals, except that bronze valves and fittings may be used without dielectric fittings for ferrous-to-ferrous or non-ferrous-to-non-ferrous connections. Provide a union at each dielectric fitting.
  - 10. Cleanouts: Provide where shown and install at all locations required by code and as required to permit cleaning of piping. Provide cleanouts full size of pipe, but not larger than 4 inch. Where cleanouts occur in floor, install top flush with floor. Install cleanouts threads with graphite. Locate cleanouts to clear cabinet work and make them easily accessible.
  - 11. Excavation, Backfilling, and Compaction Requirements For Underground Piping: Per requirements in Section 15050.
- B. Joints and Connection For Cast Iron Soil Pipe:
  - 1. Bell and Spigot: Neoprene compression seal, specifically designed for pipe and fittings used, installed in strict accordance with manufacturer's printed instructions.
  - 2. Laying of Bell and Spigot Piping: Piping, installed in bedding of trench, graded to provide uniform support for pipe with bell holes to permit joining. Bells, at upgrade end.
  - 3. Hubless: Install neoprene gasket and stainless steel shield coupling jointing assemblies with bolts alternately and incrementally tightened to 60 inch-pounds torque, minimum. Use

single set-point torque wrench manufactured specifically for this purpose, use of screwdrivers or other types of wrenches not permitted. Retorque bolts after 24 hours.

- C. Hangers and Supports:
  - 1. Provide hangers and supports for aboveground hubless cast iron pipe in accordance with CISPI Pamphlet No. 100.
  - 2. Use wall brackets for supporting piping adjacent to walls or other vertical surfaces. Use bolted steel clamps for supporting vertical lines. Place supports as near as possible to concentrated loads and, when practicable, immediately adjacent to changes in direction. Support horizontal piping so as to maintain alignment, prevent grade reversals, and prevent sagging.
  - 3. Water Piping: Per requirements in Section 15060.
- D. Natural Gas Piping:
  - 1. All natural gas pipe, fittings, and accessories in above ground exterior locations shall be protected from corrosion by field painting.
  - 2. Provide moisture pockets at the low point of any main, riser, or trapped section, consisting of drip leg 6 inches long with threaded cap.

### 3.3 FIXTURE INSTALLATION

- A. Locate fixtures where indicated on the Drawings. Refer to Architectural Drawings for mounting heights. Locate in accordance with details and dimensions on Drawings. Use the type of mountings specified.
- B. Secure the floor outlet of floor-mounted fixtures rigidly to the drainage connections and the floor.
- C. Support wall-hung fixtures rigidly with metal supporting members so no stress is transmitted to connections. Fit fixtures on finished walls without noticeable warpage on either the wall or fixture.
- D. Make all connections gas tight and water tight.
- E. Use one-piece special molded gaskets for connections between earthenware of fixtures and soil pipe flanges. Do not use bulk material, including putty and plastic, for gaskets.
- F. Provide individual vents for each fixture.
- G. Provide separate traps, where manufacturers do not supply trap for fixture.
- H. Provide silicone sealer between the top and the sides of plumbing fixtures edges and adjacent wall and countertop surfaces; General Electric No. 1200 or Dow Corning No. 780. Apply per manufacturer's recommendations to form a smooth unobtrusive joint. Install one sample joint on each type of fixture for the Contracting Officer's review before proceeding with installation of remainder of this sealant.
- I. Securely anchor water pipes (in walls or pipe chases) that are connected to shower heads.

### 3.4 CONCEALED WORK

- A. General: Do not cover up or enclose work until inspected and approved.
- B. Noncompliance: Should work be covered up or enclosed prior to required inspections, uncover work as required and, after inspection and approval, make repairs and replacements.

### 3.5 TESTING

- A. New Drainage and Vent Piping Tests:
  - 1. Make pressure test of 5 psi minimum, witnessed by the Plumbing Inspector.
  - 2. Make pipe leaks tight, repeat test.
- B. Pump Discharge Piping From the Foundation Drainage Pumps: Hydrostatic test at 1-1/2 times design working pressure for 2 hours with no leakage. If initial test fails, make pipe leaks tight and repeat test.
- C. New Water Piping: Test with water at 1-1/2 times working pressure.
- D. New Natural Gas Piping: Test with air at 10 psig for a minimum of 2 hours with no perceptible drop in pressure. Test for leaks by brushing with a soapy water solution.
  - 1. Perform pressure test required for final piping inspection by the local building official as stated in the Uniform Mechanical Code.
- E. Trap Primers: Provide test results to certify acceptable operation.

### 3.6 CLEANING UP

- A. Prior to acceptance of building, thoroughly clean exposed portions of plumbing installation, removing labels and traces of foreign substance, using only a cleaning solution approved by manufacturer of plumbing item and being careful to avoid damage to finished surfaces.

### 3.7 STERILIZATION AND FLUSHING

- A. Disinfect new domestic water piping and existing domestic water piping affected by Contractor's operations in accordance with AWWA C651. Fill piping systems with solution containing minimum of 50 parts per million (ppm) of available chlorine and allow solution to stand for minimum of 24 hours. Flush solution from the systems with domestic water until maximum residual chlorine content is within the range of 0.2 to 0.5 ppm, or the residual chlorine content of domestic water supply. Obtain at least two consecutive satisfactory bacteriological samples from new water piping, analyze by a certified laboratory, and submit the results prior to the new water piping being placed into service.

### 3.8 SYSTEMS OPERATION DEMONSTRATION

- A. Subject systems to such operating tests as are required to demonstrate that the equipment installed will operate within the specified limits through normal ranges and sequences including simulation of possible abnormal conditions. Operate every device manually and automatically, in accordance with its purpose. Operating test duration; not less than 6 hours after all major corrections have been made.

- B. If tests do not demonstrate satisfactory system performance, correct deficiencies and retest systems.

END OF SECTION 15400

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## SECTION 15780 - PACKAGED HVAC EQUIPMENT

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. Work Included: The work of this Section includes the air cooled condensing units and refrigerant piping.

#### 1.2 SUBMITTALS

- A. Product Data:
1. Air cooled condensing units.
  2. Refrigerant pipe, valves, and fittings.
- B. Performance Data: Submit performance data for each air cooled condensing unit showing static pressure versus flow rate, efficiency and brake horsepower.
- C. Sound Power Data: Provide data plotting octave band frequencies from 63 Hz to 8000 Hz versus octave band sound power level, dB re 10 to the -12 watts.
- D. Shop Drawings: Layout and installation of refrigerant piping. Obtain approval of system design and accessories from condensing unit manufacturer prior to submittal to Contracting Officer. Manufacturer shall submit certification that the condensing units will perform in accordance with capacity listed and provide stable operation through all partial load conditions. Submit calculations for sizing of refrigerant piping. Prepare detailed drawings on tracing material same size as Contract Drawings, coordinating the work of other trades so as to make all the parts fit together. These drawings shall be approved by the Contracting Officer prior to fabrication.

### PART 2 - PRODUCTS

#### 2.1 AIR COOLED CONDENSING UNITS

- A. Manufacturer and Type: Carrier "38TKB Series" or equal of Applied Products; concrete pad mounted, factory assembled, single piece, air-cooled air conditioner; UL listed. Unit shall consist of a reciprocating compressor, an air cooled coil, propeller type condenser fan, and controls. Unit shall be complete with wiring, piping, controls, and compressor. Unit shall use R22 refrigerant. Unit shall be used in a refrigeration circuit to match the direct expansion cooling coil in associated gas fired furnace specified in Section 15850.
- B. Unit Cabinet: Constructed of galvanized steel and coated with a powder coated paint. Provide access to compressor, fan, coil, and controls.
- C. Fan:
1. Condenser fan shall be direct-drive propeller type with vertical discharge.
  2. The totally enclosed fan motor shall be a permanent split capacitor type motor.
  3. Bearings: Fan motor shall have ball bearings which permit speed reduction while maintaining bearing lubrication.
  4. Condenser fan openings shall be equipped with a coated steel wire guard.
- D. Compressor: Reciprocating type.
1. Compressor shall be suitable for continuous operation from 55 degrees F to 125 degrees F in the cooling mode and down to 0 degrees F.

- 2. Crankcase Heater: An electric resistance heater shall be mounted to the base of the compressor to keep the lubricant warm during the off cycles.
- E. Condenser Coil:
  - 1. Condenser coil shall be air cooled and shall be constructed of aluminum fins and copper tubes.
  - 2. Coil shall be protected by a coated steel wire coil guard.
- F. Refrigeration Components: Refrigeration circuit components shall include liquid line service valve, suction line service valve, and filter dryer.
- G. Controls: Provide all controls to provide complete operation of the unit.
  - 1. Compressor Start Assist: Start capacitor and start relay shall give a hard boost to the compressor motor at each start-up.
  - 2. Cycle Protector: A solid state timing device shall prevent compressor from rapid recycling. Shall provide an approximate 5 minute delay after power to the compressor has been interrupted for any reason.
  - 3. High Pressure Switch: Provide an auto reset SPST switch activated by refrigerant pressure on high side of refrigerant circuit. Switch shall cycle compressor off of refrigerant pressure rises to 400 plus or minus 10 psig and resets at 298 plus or minus 20 psig. Shall provide additional protection against compressor damage due to loss of outdoor airflow.
- H. Electrical Requirements: Unit shall be suitable for a single point electrical power connection.

## 2.2 REFRIGERANT PIPING

- A. Piping:
  - 1. In sizes 5/8-inch and smaller, where bending is required, use soft temper copper tubing, ASTM B 280.
  - 2. Where bending is not required use Type L, hard temper ACR copper tube, cleaned, capped, and nitrogen charged.
  - 3. Cleaning for all tubing shall conform to ASTM B 280.
- B. Fittings: In sizes 5/8-inch and under, where soft tubing is used, short shank flare fittings are acceptable. All other fittings shall be 150 WFP wrought copper conforming to ANSI B16.22, with depth of socket and annular tolerances suitable for specified filler metal. Cast fittings are not acceptable.
- C. Refrigeration Specialties:
  - 1. Manufacturer: Alco, Henry or Sparlan.
  - 2. Moisture/Liquid Indicator Sight Glasses: Brass or bronze construction, rated for 500 psi service pressure.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Air Cooled Condensing Units:
  - 1. Anchor units to concrete pad.
  - 2. Install units in accordance with manufacturer's recommendations.
  - 3. Bearings shall be properly lubricated with oil or grease as recommended by the manufacturer.

### 3.2 REFRIGERANT PIPING

- A. Size refrigerant piping between the direct expansion cooling coils in the gas fired furnaces and air cooled condensing units per the air cooled condensing unit manufacturer's recommendation.
- B. Braze all joints with Silvaloy 15 brazing rod except use 56 percent silver solder (Silvaloy 355) at equipment connections. Use wrought copper fittings for all joints, except bending with suitable bending tool approved. All brazing in accordance with AWS Brazing Handbook. All soldering in accordance with AWS Soldering Manual.
- C. All brazing shall be done with a scavenging flow of inert gas through the tubing, as recommended by the filler metal manufacturer. Inert gas shall be maintained in the tubing when the work is discontinued.
- D. Arrange tubing trim and square to building.
- E. Provide pipe supports in accordance with Section 15060, "Pipe, Valves, and Fittings," using hydrazorb clamps with anchor channels for mounting direct to structure.
- F. Dehydrating: Each circuit shall be dehydrated by evacuation to 2.20-inch Hg absolute pressure, with separate vacuum pump before charging with refrigerant.
- G. Charging: Charge system with dry refrigerant and oil. Replace all lost refrigerant for a period of one year after date of certificate of final payment.
- H. Test, clean, and dehydrate by deep vacuum and heat. Lines and equipment shall be at temperature not lower than 70 degrees during evacuation work. Evacuation to 25 microns as read by thermocouple vacuum gage. Pressure testing shall be done in accordance with ASHRAE Standard 15. Leak test with halide torch or electronic leak detector.

### 3.3 STARTUP

- A. Air Cooled Condensing Units:
  - 1. Provide qualified field supervision to direct and be responsible for equipment charging, start-up, and checkout operations, including training for Government's personnel.
  - 2. The performance of all operating and safety controls, as well as stable machine performance over its entire operating range, shall be demonstrated by the manufacturer's representative to the satisfaction of the Contracting Officer prior to final acceptance.

END OF SECTION 15780

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## SECTION 15850 - AIR HANDLING EQUIPMENT

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. The work of this Section includes fans, range hoods, and gas fired furnaces.

#### 1.2 SUBMITTALS

- A. Product Data:
  - 1. Fans.
  - 2. Range hoods.
  - 3. Gas fired furnaces.

### PART 2 - PRODUCTS

#### 2.1 CEILING FANS

- A. Fan: Broan Model 671 deluxe ceiling fan or approved equal; UL listed; steel housing with steel mounting flanges; permanently lubricated motors; dampers; torsional spring grille mounting.
- B. Wall Cap: Where shown on Drawings, provide a Broan Model 641 wall cap; aluminum construction with built in backdraft damper and bird screen.

#### 2.2 RANGE HOODS

- A. Range Hood: Broan "4200 Series" range hood or approved equal; with fan and motor, washable aluminum grease filter, 75 watt cooktop lighting with polymeric lens and bulb, and controls with switches; 30 inches wide by 17-1/2 inches deep hood with 7 inch round vent outlet; stainless steel finish.
- B. Roof Cap: Where shown on Drawings, provide a Broan Model 634 roof cap with backdraft damper and safety screen.

#### 2.3 GAS FIRED FURNACES

- A. Manufacturer and Type: Carrier Model 58MXA high efficient 4-way multipose fixed capacity direct vent condensing natural gas fired furnace or approved equal; AGA designed certified. Unit shall be designed for an upflow installation. Unit shall include the following.
  - 1. Casing: One piece, seamless wrap around construction of galvanized.
  - 2. Insulated blower compartment.
  - 3. Foil faced insulation in the heat exchanger section of the casing.
  - 4. Blower with direct drive permanent split case capacitor motor to circulate air across the heat exchangers.
  - 5. Adjustable blower speed.
  - 6. Blower Access Panel Switch: Shall shut off all 115 volt power through furnace components whenever blower access panel is opened.
  - 7. Cased Coil: ARI 410 certified coil designed for direct expansion cooling with refrigerant; copper tubing with aluminum fins; galvanized steel casing; tested to 500 psig pressure and factory sealed and charged with a minimum of 5 psig nitrogen or refrigerated air. Coil shall be matched with the air cooled condensing unit specified under Section 15780. Provide coil with a stainless steel drain pan.

- a. Thermostatic Expansion Valves: ARI 750 diaphragm spring-loaded type with external temperature and pressure sensor bulb and tubing, and external superheat adjustment with seal cap.
- b. Solenoid Valves: ARI 760, UL-listed, two position, direct-acting or pilot-operated type.
- 8. Control Center: Microprocessor shall control sequencing and operation of the furnace and the direct expansion cooling coil; equipped with a component test feature and status light to assist in troubleshooting; selectable microprocessor blower control shall time the blower start after main burners ignite to eliminate cold air blowing into rooms.
- 9. Direct-Vent Sealed Combustion: Unit shall use 100 percent outside air for combustion in a sealed combustion system.
- 10. Hot surface igniter which shall ignite the burners directly.
- 11. Slow opening redundant gas valve.
- 12. Monoport burners.
- 13. Burner sight glass.
- 14. Rollout Switch(manual reset) to prevent overtemperature in burner area.
- 15. Primary heat exchanger and secondary condensing heat exchanger.
- 16. Inducer motor that pulls hot flue gases through the heat exchanger, maintaining negative pressure.
- 17. One inch thick cleanable filter with a side filter rack.
- 18. Pressure switch to ensure adequate flow of flue products through furnace and out vent system.
- 19. Condensate drain connection.
- 20. Junction box for 115 volt electrical power supply.
- 21. Fuses.
- 22. 24 volt transformer to provide low voltage power to furnace control center and thermostat.
- 23. Programmable thermostat for remote wall mounting where shown on Drawings.
- 24. Concentric Vent: Concentric vent kit for remote wall mounting where shown on Drawings; shall allow bent and combustion air pipes to terminate through a single exit in an exterior wall.

## 2.4 COMBUSTION AIR INTAKE PIPING AND VENT EXHAUST PIPING FOR GAS FIRED FURNACES

- A. Combustion Air Intake Piping: Schedule 40, Type 1 PVC per ASTM D1785 with joints sealed with solvent cement.
- B. Vent Exhaust Piping: Schedule 40, Type 1 PVC per ASTM D1785 with joints sealed with solvent cement.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install all equipment in accordance with manufacturer's instructions and Section 15050.
- B. Ceiling Fans: Attach fan mounting flanges to wood truss with lag bolts.
- C. Range Hoods: Fasten range hood to kitchen cabinets with wood screws. Refer to Architectural Drawings.
- D. Gas Fired Furnaces: Anchor to concrete housekeeping pad with cast-in-place anchor bolts.

1. Thermostats: Install thermostats on wall where shown on Drawings; mount 60 inches above floor. Provide wiring between the wall mounted thermostat and the furnace control center; conform to requirements in Division 16.
2. Provide wiring and conduit between the air cooled condensing unit and the furnace control center; conform to requirements in Division 16.
3. Concentric Vent: Install where shown on Drawings; seal watertight according to manufacturer's direction.
4. Combustion Air Intake Piping and Vent Exhaust Piping: Install per requirement of Section 15060.

### 3.2 CLEANING

- A. Thoroughly clean plenums and casings of all debris and blow free of all small particles of rubbish and dust before installing and making final duct connections. Wipe equipment clean, with all traces of oil, dust, dirt, or paint spots removed.
- B. Provide temporary filters for all equipment that are operated during construction, and after construction dirt has been removed from the building, install new filters. Provide a spare set of filters for all equipment.

END OF SECTION 15850

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## SECTION 15880 - DUCTWORK AND ACCESSORIES

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. Work Included: The work of this Section includes sheet metal work, grilles, dampers, and accessories.

#### 1.2 SUBMITTALS

- A. Product Data:
  - 1. Grilles.
  - 2. Dampers.
- B. Shop Drawings: Prepare detailed ductwork layout and installation drawings on tracing material same size as Contract Drawings, coordinating sheet metal work and the work of other trades including plumbing and electrical so that all components fit together. These drawings shall be completed in a timely manner and coordinated with the construction schedule.

#### 1.3 REFERENCES

- A. The publications of the organizations listed below form a part of this specification to the extent referenced.
  - 1. Sheet Metal and Air Conditioning National Association (SMACNA).
    - a. HVAC Duct Construction Standards Metal and Flexible (HDCS) Second Edition – 1995 and Addendum No.1 – November, 1997.

### PART 2 - PRODUCTS

#### 2.1 SHEET METAL WORK

- A. Ducts shall be constructed with G-90 galvanized steel unless specified otherwise.
- B. Collars: Provide wherever an exposed duct passes through a wall or floor; 1 inch wide, 18 gage angle with mitered corners.
- C. Flexible Duct Connectors: Durodyne "Neoprene" or Elgen "Hypalon"; UL listed, Hypalon coated glass fabric or neoprene coated nylon fabric; weight shall be 24 ounce per square yard; flame-resistant to 250 degrees F.
- D. Duct Construction: Construct ductwork to meet functional criteria defined in SMACNA HDCS.
  - 1. Round ducts shall be spiral seam type.
  - 2. Gages shall be per SMACNA HDCS unless specified otherwise or indicated otherwise on Drawings. Sheet metal thickness shall not be less than 26 gage.
- E. Diagonal Creasing or Beading: On all panels wider than 18 inches and 20 gage or less.
- F. Elbows:
  - 1. Rectangular or Square Ductwork: Inside radius equal to dimension of elbow in the plane of the turn; otherwise use square elbows with turning vanes.

- 2. Round Ductwork: Inside radius equal to dimension of elbow in the plane of the turn. Use segmented, segmented standing seam, pleated or stamped elbows. Adjustable elbows are not allowed.
- G. Square Corner Inserts (Turning Vanes): SMACNA Fig. 2.3 double thickness, runner type 2 with 2-1/8 inch spacing.
- H. Clothes Dryer Exhaust Ductwork:
  - 1. Single Wall: Aluminum construction; aluminum sheets shall be aluminum alloy 3003-H14, lock-forming quality, ASTM B209; reinforcements shall be aluminum alloy 6061-T6, ASTM B221; watertight seams and joint. Use aluminum rivets; sheet metal screws are not allowed.
  - 2. Wall Vent Hood: Aluminum clothes dryer wall vent hood with inlet diameter opening as shown on Drawings.
- I. Ninety Degree Branch Connections:
  - 1. Round branch ducts connecting to rectangular trunk ducts; use spin-in fittings.
  - 2. Rectangular ducts connecting to rectangular trunk ducts; use tapered 45 degree entry per SMACNA HDCS Figure 2-6.
  - 3. Do not use straight tee fittings.
- J. Outside Air Intake Hoods: Galvanized steel construction with wire mesh bird screen.

## 2.2 DAMPERS

- A. Volume Dampers and Quadrants:
  - 1. Construction: Provide dampers in accordance with SMACNA Standards. Construction of dampers shall be free from any sharp edges which would produce excessive turbulence. Damper material shall be the same as the duct material.
  - 2. Edges: Provide hemmed edges at both leading and leaving ends, side edges flanged 1/2 inch, placed so that air strikes the smooth face.
  - 3. Damper Blades: For ducts smaller than 10-inch maximum cross-section, 24 gage; 11 to 30 inches, 22 gage; larger than 30 inches, 20 gage; in ducts wider than 12 inches, multiple blade, maximum blade width 12 inches; arranged so that adjacent blades rotate in alternate directions; where length exceeds 30 inches, use a 3/8 inch rod stem fitted in a V-crease in the blade.
  - 4. Quadrants Where Ducts Are Accessible: Duro Dyne catalog numbers are specified, equivalent of Young Regulator are acceptable.
    - a. For blades with maximum dimensions under 10 inches; dial regulator with locking nut, round end spring-in bearing and square end damper bearing, Model SRHS-148.
    - b. For blades with a maximum dimensions 10 to 20 inches, Catalog No. KSR-195, dial regulator with locking nut, round end spring-in bearing and square end bearing, Model SRHS-388.
    - c. For blades with maximum dimension over 20 inches, damper quadrant with 1/2-inch size damper bearings, Model SRHS-128.

## 2.3 HANGERS FOR SHEET METAL WORK

- A. Provide hangers, supports, and attachments for all sheet metal work and equipment in accordance with SMACNA Standards.

## 2.4 GRILLES

- A. Manufacturer: Model numbers are based on Hart & Cooley; equivalent of Titus, Carnes, Anemostat, Tuttle & Bailey, Price, J&J, Metal-Aire, or Krueger are acceptable.
- B. Floor Supply Grilles (FSG): Hart & Cooley Model 411 "Deluxe Floor Diffuser"; steel construction; individually welded diffusion vanes; multi-angle fin spacing; foot operated dial control; Dover White enamel finish.
- C. Toe Supply Grilles (TSG): Hart & Cooley Model 420 "Toe-Space Grille"; steel construction; stamped face; multi-angle fins; Dover White enamel finish.
- D. Wall Supply Grilles (WSG): Hart & Cooley Model 681 "Register"; steel construction; 1/2 inch fin spacing set at 40 degrees; one-way deflection; 1-5/8 inch depth when fully opened; multi-shutter valve; interlocking valve louvers for positive shut-off; equipped with gasket; for wall installation; Dover White enamel finish.
- E. Ceiling Supply Grilles (CSG): Hart & Cooley Model 681 "Register"; steel construction; 1/2 inch fin spacing set at 40 degrees; one-way deflection; 1-5/8 inch depth when fully opened; multi-shutter valve; interlocking valve louvers for positive shut-off; equipped with gasket; for ceiling installation; Dover White enamel finish.
- F. Wall Return Grilles (WRG): Hart & Cooley Model 650 "Return Air Grille"; steel construction; 1/3 inch spaced fins set at 20 degrees; 5/16 inch Margin Turnback; Dover White enamel finish.

## PART 3 - EXECUTION

### 3.1 DUCTWORK INSTALLATION-GENERAL

- A. Fabrications, fittings, joints, take-offs, attachment to sheet metal work, turning vanes, dampers, and installation shall be in strict conformance with the applicable SMACNA HDCS.
- B. Routing of Ductwork: Avoid all structural supports and coordinate work with work of other trades.
- C. Offsets in Ductwork: Drawings do not show all offsets which may be required. Make offsets with fittings with as small angle of offset as possible; do not use turning vanes unless specifically shown.
- D. Ductwork Cleaning: Thoroughly clean all debris from the inside of all ductwork and plenums. Blow free all small particles of rubbish and dust.
  - 1. Ductwork shall be maintained clean and dry from fabrication through field installation. Open ends shall be sealed with plastic at the end of each workday. Maintain sealing procedure until installation is completed.
  - 2. Damaged, wet, and dirty ductwork shall be removed from site.
- E. Longitudinal button-punch snap lock seams will not be allowed on aluminum ductwork.
- F. Seal all ducts and equipment connections as required by the indicated seal class. Use duct sealant or gaskets. Do not use duct tape.
- G. Clothes Dryer Exhaust Ductwork: Install with a minimum upward slope of 1 inch for every 10 feet in the direction of flow.
  - 1. Termination Through Wall: Terminate with vent hood as shown on Drawings.

3.2 GRILLES

- A. Location of Grilles: Verify exact location in field.

3.3 PRESSURE TESTING FOR LEAKAGE

- A. No pressure testing is required. Visible and audible leaks perceptible to the Contracting Officer shall be sealed.

3.4 AIR BALANCING

- A. No air balancing is required.

END OF SECTION 15880

## SECTION 16010 - ELECTRICAL PROVISIONS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. The work under this division includes furnishing all permits, materials, equipment, labor, supervision, tools, and items necessary for the construction, installation, connection, testing, and operation of all electrical work for this project, as shown on the Electrical Drawings and/or defined in Division 16 of the specifications.

#### 1.2 QUALITY ASSURANCE

- A. Contractor shall provide support personnel and equipment as necessary to meet the requirements of system startup. Operation and demonstration of electrical equipment shall be in accordance with manufacturer's recommendations and shall be the responsibility of the electrical contractor.
- B. Qualifications: Use sufficient journeyman and competent supervisors in the execution of the work to ensure proper and adequate installation throughout. In the acceptance of installed work, no allowance will be made for lack of skill on the part of the workers.

#### 1.3 WORK OF OTHER TRADES

- A. The Drawings do not show complete details of the building construction. Refer to the Architectural, Structural, Civil, and Mechanical Drawings for those details, which affect the execution of this work. Specific locations of Structural or Architectural features or equipment items shall be obtained from the referenced Drawings, field measurements, or the trade providing the material or equipment. No extra payments will be allowed for failure to obtain this information.
- B. Coordination: Plan and execute work including, but not limited to, conduit and electrical equipment locations, lighting fixtures and receptacles, and in cooperation with all other trades. Including particularly Division 11 Equipment, Division 13, Special Construction and Division 15 Mechanical. Make every reasonable effort to provide all concerned with timely notice of work affecting other trades to prevent conflicts or interference as to space requirements, dimensions, openings, block-outs, sleeving or other matters which will cause delays or necessitate work-around methods. Failure to coordinate work will be considered sufficient cause for work to be altered at Contractor's expense, as directed by the Contracting Officer.
  - 1. Provide motor starters and motor circuit protective devices for equipment included in Division 15 unless the starters are supplied (manufactured) as an integral part of the equipment or as specified otherwise. Coordinate with Conveyance and Mechanical Drawings and specifications to determine extent of this work.
  - 2. Provide disconnect switch for all equipment provided under other Divisions, unless disconnect switch is supplied (manufactured) as an integral part of the equipment or as specified otherwise. Mount independently of that piece of equipment at the equipment's location.
  - 3. Provide power outlet boxes for each piece of equipment. Provide appropriate rough-in, wiring, electrical devices and final electrical connection to the equipment provided under other Divisions for a complete and functional system.

#### 1.4 EXISTING CONDITIONS

- A. Demolition work required is noted on the Drawings. Specific scope of demolition work and operating conditions to be encountered shall be verified from on-site review and coordination

with the Contracting Officer. Maintain service to existing equipment and devices to be retained in area adjacent to the existing areas scheduled for renovation. Provide temporary services as necessary to meet these conditions.

1. Remove systems or portions of systems not re-used. Do not abandon systems or portions of systems in-place.

- B. Special Protection: Exercise maximum precaution to provide positive protection for the existing building and equipment from damage of any kind, and in particular prevent any water and dust seepage into the existing building.
- C. Before starting each portion of the work, carefully compare the Contract Drawings with the actual field conditions. The Contract Drawings show equipment, raceway, and other items that are relocated or replaced because they are in the way of the new equipment, raceway and raceway supports. However, any additional interference's discovered by the Contractor shall be reported promptly to the Contracting Officer as a request for information. The Contracting Officer will issue clarifications or instructions in response to the Contractor's request for information.

#### 1.5 CODES, PERMITS, INSPECTIONS, AND FEES

- A. Comply with the requirements of the General Conditions of the Construction Contract.
- B. Obtain permits and inspections required by National, State, and Local authorities. Make arrangements for inspections by the Contracting Officer or other authority as required. Obtain a Certificate of Electrical Inspection from the local inspecting authority indicating final acceptance. Submit original certificate to the Contracting Officer, upon completion of the project in accordance with the requirements of Division 1.
- C. Provide additional copies of submittals as may be required by the Authority Having Jurisdiction to facilitate the inspection process.
- D. All work and materials shall be in accordance with requirements of the latest adopted edition of all applicable codes, regulations, ordinances and standards including, but not limited to, the following:
  1. Uniform Building code (UBC).
  2. National Electrical Code as amended and administered by the State of Montana.
  3. National Electrical Safety Code.
  4. ASHRAE 90.1 – 1999 Energy Standard For Buildings.
  5. NFPA 70B – Recommended Practice for Electrical Equipment Maintenance – 1998 Edition.
  6. NFPA 72 – National Fire Alarm Code – 1999 Edition.
  7. National Electrical Manufacturers Association.
  8. American National Standards Institute.
  9. Underwriters Laboratories, Inc.
  10. The Institute of Electrical and Electronics Engineers.
  11. International Electrical Testing Association.
  12. National Electrical Contractors Association.
  13. Malmstrom AFB Fire Marshall.
  14. Occupational Safety and Health Administration (OSHA).
  15. FAA Regulations.
  16. Malmstrom AFB base regulations.
- E. The foregoing codes shall be construed as establishing a minimum or base level of requirements. Where provisions of the various code standards conflict with each other, the more stringent provisions shall govern.

- F. Nothing in Drawings and specifications shall be construed to permit work not in conformance with these rules and regulations.
- G. Where Drawings or specifications call for material or construction of a better quality or larger sizes than required by the above-mentioned, the provisions of the drawings or specifications take precedence over requirements of the rules and regulations.
- H. Utilities: Comply with rules and requirements of local utility companies. Coordinate and pay for connections as required.

#### 1.6 EQUIPMENT APPROVALS

- A. Whenever UL standards exist for equipment with electrical components, provide UL approved equipment.
- B. All materials, equipment, and processes requiring approval of the State of Montana or other nationally recognized testing agency shall be labeled as so approved in accordance with the authority having jurisdiction.

#### 1.7 DRAWINGS AND SPECIFICATIONS

- A. The Electrical Drawings are diagrammatic and do not show exact or complete raceway and wiring configurations, or the necessary number and types of raceway fittings. Provide all labor and material required to execute the work specified herein or described on the Electrical Drawings:
  - 1. The electrical devices, equipment, apparatus, and conduit runs are shown in their approximate locations, unless dimensioned. In general locate these items symmetrically on floors, walls, and ceilings where not dimensioned, and coordinate with work of other trades to prevent interferences. The final location of all items is subject to the approval of the Contracting Officer. Do not scale electrical drawings to establish locations. Refer to architectural project drawings for locations and dimensions as applicable. Items positioned incorrectly, and without the Contracting Officer's approval are subject to be moved at the Contractor's expense.
  - 2. It is the responsibility of the Contractor to provide equipment that fits into the space allotted; has adequate acceptable clearances for installation, replacement, entry, servicing, and maintenance; and has electrical characteristics as shown. When furnished equipment, including motors, is different than indicated in the contract documents, provide required changes to electrical services, and related work as necessary to make furnished equipment completely operational. Coordinate changes with other trades.
  - 3. Report any conflict to the Contracting Officer prior to proceeding with the work. Failure to follow this instruction is considered sufficient cause to alter the work, at no cost to the Government, as directed by the Contracting Officer.
- B. Related Work Described Elsewhere: Where other divisions, particularly Division 15 - Mechanical, require electrical materials or installations under this division of the specifications, comply with all applicable requirements herein. Provide all electrical materials and installation work required to connect, test, and operate equipment described in other divisions of these specifications, as shown on the Electrical Drawings or specified hereinafter.

#### 1.8 SUBMITTALS

- A. Comply with requirements of Section 01330 - Submittal Procedures.
- B. Provide shop drawings, descriptive bulletins, data sheets, diagrams, catalog cuts or other additional information as required for the items specified hereinafter in other sections.

1.9 MATERIALS

- A. Quality: Provide all materials, products and equipment in strict accordance with all governing codes and ordinances.
- B. Quantity: Equipment and items of any one classification which are used in quantity, such as accessories, wiring devices, disconnect switches, boxes, fittings, starters, controllers, fixtures, etc., shall be products of one manufacturer and shall be used only for services recommended by the manufacturer.

1.10 OPERATING AND MAINTENANCE INSTRUCTIONS AND MANUALS

- A. Prepare operating and maintenance manuals for all equipment provided under Division 16 in accordance with Section 01701 – Closeout Procedures.
- B. Contents: Provide the following.
  - 1. Manufacturers, suppliers, and subcontractors' names, addresses, and phone numbers.
  - 2. Schedule and description of routine maintenance for each component.
  - 3. Manufacturer's cuts and rating tables, including brochures for all equipment listed under required submittals.
  - 4. Part numbers of all replaceable items.
  - 5. Shop drawings, schematic wiring diagrams showing all external connections.
  - 6. Operating Instructions.
  - 7. Written guarantees.
- C. Items described shall include, but not limited to, the equipment listed under "Shop Drawings" in this division of the specifications. Provide table of contents at front of manual indicating general content of each section. Provide index for each section of the manual with complete equipment catalog item or identification.
- D. The information and diagrams included must be on the specific equipment installed for this project. General "product line" information is not acceptable. The equipment model and catalog numbers with appropriate prefixes and suffixes must be clearly indicated on the data sheets. Any modifications to equipment in the field shall be updated on the drawings, diagrams, etc., to reflect the "As-Built" conditions.

1.11 RECORD DRAWINGS

- A. Furnish as-built drawings in conformance with the requirements of Section 01770 – Closeout Procedures.
- B. Show location of equipment, size and routing of raceway. Indicate and dimension locations and elevations of duct banks and manholes. Mark-ups may be schematic as related to interior raceway systems; however, all raceways shall be shown in proper relationship with junction boxes, panelboards, devices, and equipment. Raceways installed below grade shall be shown with both horizontal and vertical dimensions at an accuracy of plus or minus 6 inches. Keep drawings continuously updated during progress of project and ready for reference. At the completion of the project, turn over record AutoCAD Disks of updated drawings to the Contracting Officer.

1.12 SITE CONDITIONS AND METHODS

- A. Delivery, Storage and Handling:
  - 1. Handle, store and protect equipment and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations and as approved by the Contracting Officer. Replace damaged or defective items.
  - 2. Equipment with damaged factory applied finishes shall be refinished as required to bring the equipment to a like-new condition in accordance with manufacturer's recommendations.
- B. Measurements: Verify space availability by field measurement prior to submitting shop drawings for approval.
- C. Roughing-In Dimensions: Obtain roughing-in dimensions for equipment from approved shop drawings or actual equipment measurements. Ensure proper roughing-in for all equipment and fixtures to which connections are made including General Contractor and Government furnished equipment and fixtures.
- D. Cutting and patching: Keep cutting and patching to a minimum. If required, conform to specifications for the new general construction work. Finish to match existing work.
- E. Manufacturer's Installation Instructions: Follow manufacturer's written instructions where furnished. If the details are in conflict with design drawings, notify Contracting Officer for resolution.
- F. Accessibility: Install all equipment, which requires periodic servicing or repairs so it is readily accessible. Otherwise, obtain Contracting Officer's approval of location. Maintain code clearances.
- G. Rejected Materials: Remove damaged or rejected materials from the site.
- H. Operation of Equipment and Systems: Contractor is responsible for all testing.

1.13 SAFETY AND PROTECTION

- A. Protection: The Contractor shall take whatever measures are required to ensure that electrical safety and protection are maintained, including the proper covering, signage, and securing of "live" circuits.

1.14 INSTRUCTION FOR GOVERNMENT'S PERSONNEL

- A. Scope: Following initial operation of all electrical equipment and prior to acceptance of the electrical work, conduct demonstrations of equipment operation and perform instruction periods for the Government personnel.
- B. Contractor's representatives, in general, who conducts these instructions and demonstrations shall be qualified foremen or superintendents acquainted with this project and from the trade involved. For electrical systems and subsystems, the representative shall be the electrical subcontractor who performs testing and adjustment. For major equipment, the representative shall be manufacturer's representatives with operating experience and substantial design experience on this project. Their qualifications shall be submitted to the Contracting Officer before conducting the instruction period.
- C. Representatives of Government who will be present at these meetings may include the Government's operating and maintenance personnel.

- D. General Description of Instruction Periods: Include preliminary discussion and presentation of information from operation and maintenance manuals with appropriate references to drawings, followed by tours of equipment spaces explaining maintenance requirements access methods, servicing, maintenance procedures, settings, and available system and equipment adjustments.
- E. Duration of Instruction Periods: Refer to Division 16 Sections for instruction periods specific to the equipment.
- F. Scheduling of Instruction Periods: Provide notice of Contractor's readiness to conduct such instruction and demonstration periods to Contracting Officer after equipment and systems are fully operational and at least 2 weeks prior to each instruction period. Instruction and demonstration periods shall be conducted at such time as designated by and under supervision of the Contractor with the concurrence of the Contracting Officer.

#### 1.15 INSPECTION

- A. Submit written certification of inspection from the governing building authority stating that all work had been inspected, accepted, and approved as complying with existing governing ordinances and codes.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Provide materials and equipment of manufacturers regularly engaged in production of such materials or equipment, and the manufacturer's latest standard design that complies with specification requirements. Each major component of equipment shall have the manufacturer's name, address, model and serial number on a nameplate securely affixed in a conspicuous place; nameplate of the distributing agent will not be acceptable. Nameplates shall not be painted.
- B. All Electrical Equipment shall have Underwriter's Laboratories, Inc., or other approved testing facility label wherever published standards exist. Equipment in compliance with UL Standards but not bearing their label is not acceptable. If the manufacturer cannot arrange for labeling of an assembled unit at the factory, the necessary inspection and acceptance by the testing facility shall be performed in the field at no additional cost to the Government, and be acceptable to the authority having jurisdiction.

### PART 3 - EXECUTION

#### 3.1 GENERAL CONSTRUCTION

- A. Cutting and patching: Provide all cutting required for the installation of the electrical work. Patching shall be done by the general construction trades providing the material needed for restoration of floor, ceiling or wall materials. After installation of raceways, provide approved fire sealing materials to close spaces around raceways.
- B. Painting: Touch up electrical equipment factory finished surfaces as required using factory purchased paint. Coordinate field painting requirements with the Contracting Officer prior to final trim and cover installation. Do not paint screw heads, hinges, nameplates, hardware, etc. All surface-mounted raceways in finished areas shall be painted. Coordinate timing of installation to minimize conflicts with painting requirements. Coordinate with painting specified under Section 09900-Paints and Coatings.

- C. Cleaning: Promptly remove waste material and rubbish caused by electrical work. Prior to energizing equipment, remove all shipping materials, construction dirt and debris, vacuum and wipe-down all internal areas. At completion of the project, clean All electrical equipment inside and out installed under this Contract.
- D. Housekeeping and Equipment Pads: Comply with requirements of Section 03300 – Cast-in-Place Structural Concrete. Pads shall be tied seismically and integral to slab on which they are placed.
  - 1. Housekeeping Pads: Coordinate size and location of housekeeping pads for all ground-mounted electrical equipment. Pads shall be 8 inches thick (nominal). Provide 1 inch by 1 inch chamfer at top edges of all pads.
  - 2. Equipment Pads: Coordinate size and location of all equipment pads (Switch, Transformer, etc.) Pads shall be sized as required/recommended by equipment supplier.

### 3.2 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Verify that abandoned wiring and equipment serve only abandoned facilities.
- B. Demolition Drawings are based on field observation and existing record documents. Report discrepancies to Contracting Officer before disturbing existing installation.
- C. Beginning of demolition means installer accepts existing conditions.
- D. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- E. Repair adjacent construction and finishes damaged during demolition and extension work.
- F. Maintain access to existing installations scheduled to remain active.
- G. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- H. Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections.
- I. Remove, relocate, and extend existing installations to accommodate new construction.
- J. Remove abandoned wiring back to source of supply.
- K. Remove abandoned conduit, boxes and equipment from all accessible surfaces and spaces. Cut conduit flush with concrete walls and floors, and patch surfaces.
- L. Disconnect and remove abandoned devices.
- M. Maintain access to existing electrical installations, which remain active. Modify installation or provide access panel as appropriate.

### 3.3 MISCELLANEOUS

- A. Phase Relationship: Maintain consistent phase relationship and rotation throughout the project. Check and identify proper rotation of equipment prior to energizing said equipment.

END OF SECTION 16010

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## SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes grounding electrodes and conductors; equipment grounding conductors; bonding methods and materials; conduit and equipment supports; anchors and fasteners; nameplates and labels; wire markers; raceway markers; underground warning tape; sealing and fireproofing of sleeves and openings between conduits.

#### 1.2 REFERENCES

- A. NECA (National Electrical Contractors Association) - Standard of Installation.
- B. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

#### 1.3 SYSTEM DESCRIPTION

- A. Grounding systems use the following elements as grounding electrodes:
  - 1. Metal underground water pipe.
  - 2. Rod electrode.
- B. Anchor and fasten electrical products to building elements and finishes as follows:
  - 1. Concrete Structural Elements: Provide expansion anchors.
  - 2. Concrete Surfaces: Provide self-drilling anchors and expansion anchors.
  - 3. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts and hollow wall fasteners.
  - 4. Wood Elements: Provide wood screws.
- C. Identify electrical components as follows:
  - 1. Nameplate for each electrical distribution and control equipment enclosure.
  - 2. Wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
  - 3. Raceway marker for each raceway longer than 6 feet.
  - 4. Underground warning tape along length of each underground raceway or cable.

#### 1.4 DESIGN REQUIREMENTS

- A. Select materials, sizes, and types of anchors, fasteners, and supports to carry loads of equipment and raceway, including weight of wire and cable in raceway.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. Grounding System Resistance: 25 ohms.

#### 1.6 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit grounding electrodes and connections; for fastening components; and nameplates, labels, and markers.

- C. Test Reports: Indicate overall resistance to ground [and resistance of each electrode].

#### 1.7 CLOSEOUT SUBMITTALS

- A. Section 01700 - Closeout Procedures.
- B. Project Record Documents: Record actual locations of components and grounding electrodes.

#### 1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

#### 1.9 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

### PART 2 - PRODUCTS

#### 2.1 ROD ELECTRODES

- A. Material: Copper-clad steel.
- B. Diameter: 3/4 inch.
- C. Length: 10 feet.

#### 2.2 MECHANICAL CONNECTORS

- A. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

#### 2.3 EXOTHERMIC CONNECTIONS

- A. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

#### 2.4 WIRE

- A. Material: Stranded copper.
- B. Grounding Electrode Conductor.

#### 2.5 ANCHORS AND FASTENERS

- A. Materials and Finishes: Corrosion resistant.

#### 2.6 FORMED STEEL CHANNEL

- A. Description: Galvanized steel.

## 2.7 NAMEPLATES AND LABELS

- A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.
- B. Letter Size:
  - 1. 1/8 inch letters for identifying individual equipment and loads.
  - 2. 1/4 inch letters for identifying grouped equipment and loads.
- C. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background.

## 2.8 WIRE MARKERS

- A. Description: Cloth tape, split sleeve, or [tubing] type wire markers.
- B. Legend:
  - 1. Power and Lighting Circuits: Branch circuit or feeder number.

## 2.9 CONDUIT MARKERS

- A. Description: Split-tube type.
- B. Color:
  - 1. 12,470Y/7,200 Volt System: Red lettering on white background.
  - 2. 120/240 Volt System: Black lettering on white background.
- C. Legend:
  - 1. Medium Voltage System: HIGH VOLTAGE.
  - 2. 240 Volt System: 240 VOLTS.

## 2.10 UNDERGROUND WARNING TAPE

- A. Description: 4 inch wide plastic tape, detectable type, colored red with suitable warning legend describing buried electrical lines.

## 2.11 SEALING AND FIREPROOFING

- A. Fire and Smoke Rated Surfaces:
  - 1. Manufacturers:
    - a. 3M CP 25N/S or CP25S/L caulk.
    - b. 3M FS 195 wrap or strip with restricting collar.
    - c. 3M CS 195 composite sheet.
    - d. Pipe Shield, Inc. series F fire barrier kits.
    - e. Proset Systems fire rated floor and wall penetrations.
    - f. Insta-Foam Products Insta-Fire Seal Firestop Foam.
    - g. Dow Corning Fire Stop System.
- B. General:
  - 1. Furnish UL listed products.
  - 2. Select products with rating not less than rating of wall or floor being penetrated.
- C. Non-Rated Surfaces:
  - 1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where conduit is exposed.

2. For exterior wall openings below grade, furnish modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill annular space between conduit and cored opening or water-stop type wall sleeve.
3. For interior wall or floor openings, furnish one of the following to effect seal:
  - a. Tremco Dymonic.
  - b. Sika Corp. Sikaflex Ia.
  - c. Sonneborn Sonolastic NPI.
  - d. Mameco Vilken 116 urethane caulk.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Verify final backfill and compaction has been completed before driving rod electrodes.
- C. Verify abandoned wiring and equipment serve only abandoned facilities.

#### 3.2 EXISTING WORK

- A. Demolition Drawings are based on casual field observation and existing record documents. Report discrepancies to Contracting Officer before disturbing existing installation.
- B. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- C. For occupied buildings, install temporary wiring and connections to maintain existing systems in service during construction.
- D. Perform work on energized equipment or circuits with experienced and trained personnel.
- E. Remove, relocate, and extend existing installations to accommodate new construction.
- F. Repair adjacent construction and finishes damaged during demolition and extension work.
- G. Remove exposed abandoned grounding and bonding components, fasteners and supports, and electrical identification components, including abandoned components above accessible ceiling finishes. Cut embedded support elements flush with walls and floors. Patch surfaces damaged by removal of existing components.

#### 3.3 INSTALLATION

- A. Grounding and Bonding Installation:
  1. Install rod electrodes at locations as indicated on Drawings. Install additional rod electrodes to achieve specified resistance to ground.
  2. Install bonding meeting Regulatory Requirements.
  3. Bond together each metallic raceway, pipe, duct and other metal objects.
  4. Locate and install anchors, fasteners, and supports in accordance with NECA "Standard of Installation".
  5. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
  6. Obtain permission from Contracting Officer before drilling or cutting structural members.

- B. Supports:
  - 1. Fabricate supports from structural steel or formed steel members. Rigidly weld members or install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
  - 2. Install surface mounted cabinets and panelboards with minimum of four anchors.
  - 3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch off wall.
  - 4. Install sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
- C. Identification Components:
  - 1. Degrease and clean surfaces to receive nameplates and labels.
  - 2. Install nameplate and label parallel to equipment lines.
  - 3. Secure nameplate to equipment front using screws.
  - 4. Secure nameplate to inside surface of door on recessed panelboard in finished locations.
  - 5. Conduit Marker Spacing: 20 feet on center.
  - 6. Identify underground conduits using one underground warning tape for each trench at 3 inches below finished grade.
- D. Raceway Painting: Identify conduit using field painting in accordance with Section 09900.
  - 1. Paint each conduit longer than 6 feet .
- E. Paint bands 20 feet on center.
  - 1. Color:
    - a. 240 Volt System: Yellow.
    - b. Telephone System: Green.

### 3.4 SEALING AND FIREPROOFING

- A. Fire Rated Surface:
  - 1. Seal opening at floor, wall, ceiling' and roof as follows:
    - a. Install 12 gage steel sleeve through opening and extending beyond minimum of 1 inch on each side of building element.
    - b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
    - c. Pack void with backing material.
    - d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.
- B. Non-Rated Surfaces:
  - 1. Seal opening through non-fire rated wall, floor, ceiling, and as follows:
    - a. Install 12 gage steel sleeve through opening and extending beyond minimum of 1 inch on each side of building element.
    - b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
    - c. Install type of firestopping material recommended by manufacturer.
  - 2. Install escutcheons, floor plates or ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.
  - 3. Exterior wall openings below grade: Assemble rubber links of mechanical seal to size of conduit and tighten in place, in accordance with manufacturer's instructions.

### 3.5 FIELD QUALITY CONTROL

- A. Section 01450 - Quality Control: Testing and inspection services.

- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.

END OF SECTION 16050

## SECTION 16121 - MEDIUM-VOLTAGE CABLE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes medium voltage cable, cable terminations and sectionalizing cabinets.

#### 1.2 REFERENCES

- A. IEEE C2 (Institute of Electrical and Electronics Engineers) - National Electrical Safety Code.
- B. IEEE 48 (Institute of Electrical and Electronics Engineers) - Test Procedures and Requirements for High- Voltage Alternating-Current Cable Terminations.
- C. NEMA WC 8 (National Electrical Manufacturers Association) - Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
- D. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association).

#### 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit for cable, terminations, and accessories.
- C. Test Reports: Indicate results of cable test in tabular form and in plots of current versus voltage for incremental voltage steps, and current versus time at 30 second intervals at maximum voltage.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Section 01770 - Closeout Procedures: Closeout procedures.
- B. Project Record Documents: Record actual sizes and locations of cables.
- C. Operation and Maintenance Data: Submit instructions for testing and cleaning cable and accessories.

#### 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Installer: Company specializing in installing Products specified in this Section with minimum three years documented experience.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect cable ends from entrance of moisture.

## PART 2 - PRODUCTS

### 2.1 MEDIUM VOLTAGE CABLE

- A. Manufacturers:
  - 1. American Insulated Wire Co.
  - 2. Diamond Wire & Cable Co.
  - 3. Cablec Corp.
  - 4. Essex Group Inc.
  - 5. General Cable Co.
  - 6. Rome.
  - 7. Southwire Co.
  - 8. Substitutions: Section 01600 - Product Requirements.
- B. Product Description: NEMA WC 8, ethylene propylene rubber insulated MV-105 cable.
- C. Voltage: 15 kV, 133% insulation.
- D. Conductor: Copper, stranded, with extruded conducting stress control shield.
- E. Insulation: Ethylene propylene rubber, 220 mils thick over the conductor stress control shield.
- F. Drain: Six corrugated drain wires embedded in extruded conducting chlorinated polyethylene insulation shield.
- G. Jacket: PVC, 80 mils minimum thickness.

### 2.2 MODULAR CABLE TERMINATION

- A. Product Description: IEEE 48, Class 1, molded-rubber cable termination in kit form with stress cone, ground clamp, non-tracking rubber skirts, 200 amp loadbreak and 600 amp non-loadbreak connector, rubber cap, and aerial lug.

### 2.3 SECTIONALIZING CABINET

- A. Product Description: Single phase 15 kV 3 and 4-way, 200 amp and 600 amp junctions mounted on universal mounting plate. Include parking stands.
- B. Housing: 12 gauge mild steel, with top hinged diagonally cut removable cover, padlock hasp with shrouded pentahead bolt.
- C. Dimensions: 30 inch high by 30 inch wide by 18 inch deep, maximum.
- D. Factory Finishing:
  - 1. Clean surfaces before applying paint.
  - 2. Apply corrosion resistant perimeter surfaces.
  - 3. Apply finish coat of baked enamel paint to 4 mils thick.
  - 4. Finish Color: Antique Linen, Federal Spec #23578.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Verify duct is ready to receive cable.
- C. Verify routing and termination locations of cable prior to rough-in.

#### 3.2 PREPARATION

- A. Use swab to clean ducts before pulling cables.

#### 3.3 EXISTING WORK

- A. Remove abandoned medium-voltage cable.
- B. Maintain access to existing medium-voltage cable and other installations remaining active and requiring access. Modify installation or provide access panel.
- C. Extend existing medium-voltage cable installations using materials and methods as specified.
- D. Clean and repair existing medium-voltage cable to remain or to be reinstalled.

#### 3.4 INSTALLATION

- A. Avoid abrasion and other damage to cables during installation.
- B. Use suitable manufacturer approved lubricants and pulling equipment.
- C. Sustain cable pulling tensions and bending radii below manufacturer's recommended limits.
- D. Ground cable shield at each termination and splice.
- E. Hi-pot test all new cables per NEMA WC8 prior to energizing.
- F. Install sectionalizing cabinets plumb and level on concrete pad.
- G. Ground and bond sectionalizing cabinets in accordance with Section 16050. Test grounding by three point fall-of-potential method.

#### 3.5 FIELD QUALITY CONTROL

- A. Inspect exposed cable sections for physical damage.
- B. Inspect cable for proper connections.
- C. Inspect shield grounding, cable supports, and terminations for proper installation.
- D. Inspect and test in accordance with NETA ATS, except Section 4.
- E. Perform inspections and tests listed in NETA ATS, Section 7.3.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Protect installed cables from entrance of moisture.

END OF SECTION 16121

## SECTION 16123 - (600 VOLTS AND LESS) WIRE AND CABLE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes building wire and cable and nonmetallic-sheathed cable (NM-B and NMC-B).

#### 1.2 REFERENCES

- A. NECA (National Electrical Contractors Association) - Standard of Installation.
- B. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

#### 1.3 SYSTEM DESCRIPTION

- A. Product Requirements: Provide products as follows:
  - 1. Solid conductor for feeders and branch circuits 10 AWG and smaller.
  - 2. Stranded conductors for control circuits.
  - 3. Conductor not smaller than 12 AWG for power and lighting circuits.
  - 4. Conductor not smaller than 16 AWG for control circuits.
  - 5. 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.
- B. Wiring Methods: Provide the following wiring methods:
  - 1. Concealed Dry Interior Locations: Use only building wire, Type THHN/THWN or XHHW insulation, in raceway and nonmetallic-sheathed cable (NMC).
  - 2. Exposed Dry Interior Locations: Use only building wire, Type THHN/THWN or XHHW insulation, in raceway and nonmetallic-sheathed cable (NMC).
  - 3. Above Accessible Ceilings: Use only building wire, Type THHN/THWN or XHHW insulation, in raceway and nonmetallic-sheathed cable (NMC).
  - 4. Wet or Damp Interior Locations: Use only building wire, Type THHN or XHHW insulation, in raceway.
  - 5. Exterior Locations: Use only building wire, Type THHN/THWN or XHHW insulation in raceway and service-entrance cable (USE).
  - 6. Underground Locations: Use only building wire, Type THHN/THWN or XHHW insulation in raceway and service-entrance cable (USE).

#### 1.4 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit for building wire and each cable assembly type.
- C. Test Reports: Indicate procedures and values obtained.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Section 01770 - Closeout Procedures: Requirements for submittals.
- B. Project Record Documents: Record actual locations of components and circuits.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

1.7 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

1.8 COORDINATION

- A. Section 01310 - Administrative Requirements: Requirements for coordination.
- B. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.
- C. Wire and cable routing indicated is approximate unless dimensioned.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

- A. Manufacturers:
  - 1. American Insulated Wire Co.
  - 2. Diamond Wire & Cable Co.
  - 3. Cablec Corp.
  - 4. Essex Group Inc.
  - 5. General Cable Co.
  - 6. Rome.
  - 7. Southwire Co.
  - 8. Substitutions: Section 01600 - Product Requirements.
- B. Product Description: Single conductor insulated wire.
- C. Conductor: Copper.

2.2 NONMETALLIC-SHEATHED CABLE (NM-B AND NMC-B)

- A. Manufacturers:
  - 1. American Insulated Wire Co.
  - 2. Diamond Wire & Cable Co.
  - 3. Cablec Corp.
  - 4. Essex Group Inc.
  - 5. General Cable Co.
  - 6. Rome.
  - 7. Southwire Co.
  - 8. Substitutions: Section 01600 - Product Requirements.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.

## PART 3- EXECUTION

### 3.1 EXAMINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Verify interior of building has been protected from weather.
- C. Verify mechanical work likely to damage wire and cable has been completed.
- D. Verify raceway installation is complete and supported.

### 3.2 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

### 3.3 EXISTING WORK

- A. Remove exposed abandoned wire and cable, including abandoned wire and cable above accessible ceiling finishes. Patch surfaces where removed cables pass through building finishes. Where wire and cable enters inaccessible spaces, cut flush and abandon in place.
- B. Disconnect abandoned circuits and remove circuit wire and cable. Remove abandoned boxes in accessible spaces when wire and cable servicing boxes is abandoned and removed. Install blank cover for abandoned boxes not removed.
- C. Provide access to existing wiring connections remaining active and requiring access. Modify installation or install access panel.
- D. Extend existing circuits using materials and methods as specified. Do not reconnect any 14 gauge wire.
- E. Clean and repair existing wire and cable remaining or is wire and cable to be reinstalled.

### 3.4 INSTALLATION

- A. Route wire and cable to meet Project conditions.
- B. Install wire and cable in accordance with NECA "Standard of Installation."
- C. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- D. Identify wire and cable under provisions of Section 16050. Identify each conductor with its circuit number or other designation indicated.
- E. Special Techniques--Building Wire in Raceway:
  - 1. Pull conductors into raceway at same time.
  - 2. Install building wire 4 AWG and larger with pulling equipment.
- F. Special Techniques - Cable:
  - 1. Protect exposed cable from damage.
  - 2. Support cables above accessible ceiling, using spring metal clips or plastic cable ties to support cables from structure [or ceiling suspension system]. Do not rest cable on ceiling panels.
  - 3. Use suitable cable fittings and connectors.

4. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
5. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
6. Install solid conductor for feeders and branch circuits 10 AWG and smaller.
7. Install stranded conductors for branch circuits 10 AWG and smaller. However, when stranded conductors are used in lieu of solid, then install crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.

### 3.5 WIRE COLOR

- A. General
  1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the following:
    - a. Black and red for single phase circuits at 120/240 volts.
  2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:
    - a. Black and red for single phase circuits at 120/240 volts.
- B. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.
- C. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.
- D. Feeder Circuit Conductors: Uniquely color code each phase.
- E. Ground Conductors:
  1. For 6 AWG and smaller: Green.
  2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

### 3.6 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

END OF SECTION 16123

## SECTION 16130 - RACEWAY AND BOXES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.

#### 1.2 REFERENCES

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
- C. NECA (National Electrical Contractor's Association) - "Standard of Installation"
- D. NEMA FB 1 (National Electrical Manufacturers Association) - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- E. NEMA OS 1 (National Electrical Manufacturers Association) - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- F. NEMA OS 2 (National Electrical Manufacturers Association) - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
- G. NEMA RN 1 (National Electrical Manufacturers Association) - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- H. NEMA TC 2 (National Electrical Manufacturers Association) - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
- I. NEMA TC 3 (National Electrical Manufacturers Association) - PVC Fittings for Use with Rigid PVC Conduit and Tubing.
- J. NEMA 250 (National Electrical Manufacturers Association) - Enclosures for Electrical Equipment (1000 Volts Maximum).

#### 1.3 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. Underground More than 5 feet outside Foundation Wall: Provide thickwall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.
- C. Underground Within 5 feet from Foundation Wall: Provide rigid steel conduit. Provide cast metal boxes.
- D. Under Slab on Grade: Provide rigid steel conduit, intermediate metal conduit and thickwall nonmetallic conduit. Provide cast or nonmetallic metal boxes.

- E. Outdoor Locations, Above Grade: Provide rigid steel conduit, intermediate metal conduit and electrical metallic tubing. Provide cast metal or nonmetallic outlet, pull, and junction boxes.
- F. Through Slab on Grade: Provide rigid steel conduit and intermediate metal conduit. Provide cast sheet metal and nonmetallic boxes.
- G. Wet and Damp Locations: Provide rigid steel conduit, intermediate metal conduit and electrical metallic tubing. Provide cast metal or nonmetallic outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
- H. Concealed Dry Locations: Provide rigid steel conduit, intermediate metal conduit and electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pullboxes. Provide nonmetallic boxes for NMC cable.
- I. Exposed Dry Locations: Provide rigid steel conduit, intermediate metal conduit and electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pullboxes. Provide nonmetallic boxes for NMC cable.

#### 1.4 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 1/2 inch unless otherwise specified.

#### 1.5 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit for the following:
  - 1. Flexible metal conduit.
  - 2. Liquidtight flexible metal conduit.
  - 3. Nonmetallic conduit.
  - 4. Raceway fittings.
  - 5. Conduit bodies.
  - 6. Pull and junction boxes.
  - 7. Handholes.
- C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Section 01770 – Closeout Procedures: Closeout procedures.
- B. Project Record Documents:
  - 1. Record actual routing of conduits larger than 2 inch trade size.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.8 COORDINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate installation of outlet boxes for equipment connected under Section 16150.
- C. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Intermediate Metal Conduit (IMC): Rigid steel.
- C. Fittings and Conduit Bodies: NEMA FB 1; all steel fittings.

2.2 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1.

2.3 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC jacket.
- B. Fittings: NEMA FB 1.

2.4 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel or malleable iron, compression type. Set screw and indenter type are not acceptable.

2.5 NONMETALLIC CONDUIT

- A. Product Description: NEMA TC 2; Schedule 40 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.6 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
  - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required.
  - 2. Concrete Ceiling Boxes: Concrete type.
- B. Nonmetallic Outlet Boxes: NEMA OS 2.

- C. Cast Boxes: NEMA FB 1, Type FD, aluminum and cast fer alloy. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.
- D. Wall Plates for Finished Areas: As specified in Section 16140.
- E. Wall Plates for Unfinished Areas: Furnish gasketed cover.

## 2.7 PULL AND JUNCTION BOXES

- A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
- B. Hinged Enclosures: As specified in Section 16131.
- C. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box: Material: Galvanized cast iron and cast aluminum. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.
- D. Fiberglass Concrete composite Handholes: Die-molded, glass-fiber concrete composite hand holes: Cover: Glass-fiber concrete composite, weatherproof cover with nonskid finish.
  - 1. Minimum Inside dimensions: 28 inches long x 15 inches wide x 14 inches deep, or as required by code.
  - 2. Cover Legend: "ELECTRIC", "TELEPHONE", and "CABLE TV".

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

### 3.2 EXISTING WORK

- A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.

### 3.3 INSTALLATION

- A. Install raceway and boxes in accordance with NECA "Standard of Installation."
- B. Ground and bond raceway and boxes in accordance with Section 16050.

- C. Fasten raceway and box supports to structure and finishes in accordance with Section 16050.
- D. Identify raceway and boxes in accordance with Section 16050.
- E. Arrange raceway and boxes to maintain headroom and present neat appearance.

#### 3.4 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.
- B. Install nonmetallic conduit.
- C. Arrange raceway supports to prevent misalignment during wiring installation.
- D. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- E. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 16050.
- F. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- G. Do not attach raceway to ceiling support wires or other piping systems.
- H. Construct wireway supports from steel channel specified in Section 16050.
- I. Route exposed raceway parallel and perpendicular to walls.
- J. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- K. Route conduit under slab from point-to-point.
- L. Conduit in Slab not permitted.
- M. Maintain clearance between raceway and piping for maintenance purposes.
- N. Maintain 12 inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- O. Cut conduit square using saw or pipecutter; de-burr cut ends.
- P. Bring conduit to shoulder of fittings; fasten securely.
- Q. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- R. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations.

- S. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2 inch size.
- T. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- U. Install fittings to accommodate expansion and deflection where raceway crosses control and expansion joints.
- V. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
- W. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
- X. Close ends and unused openings in wireway.

### 3.5 INSTALLATION - BOXES

- A. Install wall mounted boxes at elevations to accommodate mounting heights specified in section for outlet device.
- B. Adjust box location up to 10 feet prior to rough-in to accommodate intended purpose.
- C. Orient boxes to accommodate wiring devices oriented as specified in Section 16140.
- D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- E. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- F. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- G. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches separation. Install with minimum 24 inches separation in acoustic rated walls.
- H. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- I. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- J. Install nonmetallic boxes on wood studs.
- K. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- L. Install adjustable steel channel fasteners for hung ceiling outlet box.
- M. Do not fasten boxes to ceiling support wires or other piping systems.
- N. Support boxes independently of conduit.
- O. Install gang box where more than one device is mounted together. Do not use sectional box.
- P. Install gang box with plaster ring for single device outlets.

3.6 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods in accordance with Section 16050.
- B. Locate outlet boxes to allow luminaires positioned as indicated on Drawings.
- C. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.7 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

3.8 CLEANING

- A. Section 01770 – Closeout Procedures: Final cleaning.
- B. Clean interior of boxes to remove dust, debris, and other material.
- C. Clean exposed surfaces and restore finish.

END OF SECTION 16130

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## SECTION 16140 - WIRING DEVICES GENERAL

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes wall switches; receptacles; and device plates.

#### 1.2 REFERENCES

- A. NECA (National Electrical Contractors Association) - Standard of Installation.
- B. NEMA WD 1 (National Electrical Manufacturers Association) - General Requirements for Wiring Devices.
- C. NEMA WD 6 (National Electrical Manufacturers Association) - Wiring Device -- Dimensional Requirements.

#### 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit manufacturer's catalog information showing dimensions, colors, and configurations.

#### 1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

#### 1.5 EXTRA MATERIALS

- A. Section 01700 - Execution Requirements: Spare parts and maintenance products.
- B. Furnish two of each style, size, and finish wall plate.

### PART 2 - PRODUCTS

#### 2.1 WALL SWITCHES

- A. Manufacturers:
  - 1. Arrow Hart.
  - 2. Bryant.
  - 3. GE.
  - 4. Hubbell.
  - 5. Leviton.
  - 6. Pass & Seymour.
  - 7. Substitutions: Not Permitted.
- B. Product Description: NEMA WD 1, Specification grade, AC only general-use snap switch.
- C. Body and Handle: Ivory plastic with toggle handle.
- D. Ratings:
  - 1. Voltage: 120-277 volts, AC.

2. Current: 20 amperes.

## 2.2 RECEPTACLES

- A. Manufacturers:
  1. Arrow Hart.
  2. Bryant.
  3. GE.
  4. Hubbell.
  5. Leviton.
  6. Pass & Seymour.
  7. Substitutions: Not permitted.
- B. Product Description: NEMA WD 1, Specification grade general use receptacle.
- C. Device Body: Ivory plastic.
- D. Configuration: NEMA WD 6, type as indicated on Drawings.
- E. Convenience Receptacle: Type 5-20.
- F. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

## 2.3 WALL PLATES

- A. Manufacturers:
  1. Arrow Hart.
  2. Bryant.
  3. GE.
  4. Hubbell.
  5. Leviton.
  6. Pass & Seymour.
  7. Substitutions: Not permitted.
- B. Decorative Cover Plate: Ivory, nylon.
- C. Weatherproof Cover Plate: Gasketed cast metal plate with threaded and gasketed device cover.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Verify outlet boxes are installed at proper height.
- C. Verify wall openings are neatly cut and completely covered by wall plates.
- D. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

### 3.2 PREPARATION

- A. Clean debris from outlet boxes.

### 3.3 EXISTING WORK

- A. Disconnect and remove abandoned wiring devices.
- B. Modify installation to maintain access to existing wiring devices to remain active.
- C. Clean and repair existing wiring devices to remain or to be reinstalled.

### 3.4 INSTALLATION

- A. Install in accordance with NECA "Standard of Installation."
- B. Install devices plumb and level.
- C. Install switches with OFF position down.
- D. Install 3- and 4 way switches so that the circuit is off when all switch handles are in the down position.
- E. Install receptacles with grounding pole on bottom.
- F. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.
- G. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
- H. Connect wiring devices by wrapping solid conductor around screw terminal. Install stranded conductor for branch circuits 10 AWG and smaller. When stranded conductors are used in lieu of solid, use crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under device screws.
- I. Use jumbo size plates for outlets installed in masonry walls.
- J. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

### 3.5 INTERFACE WITH OTHERPRODUCTS

- A. Coordinate locations of outlet boxes provided under Section 16130 to obtain mounting heights as specified and as indicated on drawings.
- B. Install wall switch 48 inches above finished floor.
- C. Install convenience receptacle 18 inches above finished floor.
- D. Install convenience receptacle 6 inches above counter.

### 3.6 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.
- B. Operate each wall switch with circuit energized and verify proper operation.
- C. Verify each receptacle device is energized.
- D. Test each receptacle device for proper polarity.

- E. Test each GFCI receptacle device for proper operation.

3.7 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.

3.8 CLEANING

- A. Section 01770 – Closeout Procedures: Final cleaning.
- B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION 16140

## SECTION 16150 - WIRING CONNECTIONS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes electrical connections to equipment.

#### 1.2 REFERENCES

- A. NEMA WD 1 (National Electrical Protection Association) - General Purpose Wiring Devices.
- B. NEMA WD 6 (National Electrical Protection Association) - Wiring Devices - Dimensional Requirements.

#### 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit wiring device manufacturer's catalog information showing dimensions, configurations, and construction.
- C. Manufacturer's installation instructions.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Section 01770 - Closeout Procedures: Submittal procedures.
- B. Project Record Documents: Record actual locations, sizes, and configurations of equipment connections.

#### 1.5 COORDINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
- C. Determine connection locations and requirements.
- D. Sequence rough-in of electrical connections to coordinate with installation of equipment.
- E. Sequence electrical connections to coordinate with start-up of equipment.

### PART 2 - PRODUCTS

Not Used.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.

- B. Verify equipment is ready for electrical connection, for wiring, and to be energized.

### 3.2 EXISTING WORK

- A. Remove exposed abandoned equipment wiring connections, including abandoned connections above accessible ceiling finishes.
- B. Disconnect abandoned utilization equipment and remove wiring connections. Remove abandoned components when connected raceway is abandoned and removed. Install blank cover for abandoned boxes and enclosures not removed.
- C. Extend existing equipment connections using materials and methods as specified.

### 3.3 INSTALLATION

- A. Make electrical connections.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
- C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- D. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
- E. Install terminal block jumpers to complete equipment wiring requirements.
- F. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

### 3.4 ADJUSTING

- A. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

END OF SECTION 16150

## SECTION 16210 - ELECTRICAL UTILITY SERVICES GENERAL

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes connection of electric service to each housing unit from pad mounted transformers.

#### 1.2 SYSTEM DESCRIPTION

- A. The medium voltage distribution system is owned by Malmstrom AFB.
- B. System Characteristics: 120/240 volts, single phase, three-wire, 60 Hertz.
- C. Service Entrance: Underground.
- D. Underground Service Provisions: Underground service entrance to building service entrance equipment.
  - 1. Utility Raceway Connection: At pad-mounted transformer.
  - 2. Utility Service-Entrance Conductor Connection: At pad-mounted transformer.

#### 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Submit Utility-Company-prepared drawings.

#### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Malmstrom AFB written requirements and these specifications.
- B. Maintain one copy of each document on site.

#### 1.5 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

### PART 2- PRODUCTS

#### 2.1 UTILITY METERS

- A. Not required.

#### 2.2 UTILITY METER BASE

- A. Product Description: Combination meter base and main circuit breaker rated 200 amperes per Malmstrom AFB requirements.
  - 1. UL listed as service entrance equipment.
  - 2. Equipped with neutral bus, ground bus and ground jumper.
  - 3. Provide with meter jumper bars and socket cover.
  - 4. Provide single and dual units as shown on drawings.

2.3 TRANSFORMER AND SECTIONALIZING CABINET PADS

- A. Product Description: Cast-in-place concrete and Precast concrete pad sized as indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Verify service equipment is ready to be connected and energized.

3.2 EXISTING WORK

- A. Remove exposed abandoned service entrance raceway and conductors. Cut raceway flush with walls and floors, and patch surfaces.
- B. Disconnect abandoned service equipment and remove.
- C. Maintain access to existing service equipment, boxes, metering equipment, and other installations remaining active and requiring access. Modify installation or provide access panel.
- D. Extend existing service installations using materials and methods as specified.
- E. Clean and repair existing service equipment to remain or to be reinstalled.

3.3 INSTALLATION

- A. Install cast-in-place concrete pad for transformer, in accordance with Section 03300.

END OF SECTION 16210

## SECTION 16271 - PAD-MOUNTED TRANSFORMERS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes liquid-filled pad-mounted distribution transformers.

#### 1.2 REFERENCES

- A. ANSI C37.47 - Specifications for Distribution Fuse Disconnecting Switches, Fuse Supports, and Current-Limiting Fuses.
- B. ANSI C57.12.26 - Pad-Mounted Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers for Use with Separable Insulated High-Voltage Connectors, High Voltage 34 500 Grd Y/19 920 Volts and Below; 2500 kVA and Smaller.
- C. ANSI C57.12.28 - Switchgear and Transformers--Pad-Mounted Equipment--Enclosure Integrity.
- D. IEEE C57.12.00 (Institute of Electrical and Electronics Engineers) - General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.
- E. IEEE C57.12.90 (Institute of Electrical and Electronics Engineers) - Test Code for Liquid-Immersed Distribution Power, and Regulating Transformers and Guide for Short-Circuit Testing of Distribution and Power Transformers.
- F. IEEE C57.13 (Institute of Electrical and Electronics Engineers) - Requirements for Instrument Transformers.
- G. IEEE C57.106 (Institute of Electrical and Electronics Engineers) - Guide for Acceptance and Maintenance of Insulating Oil in Equipment.
- H. IEEE 386 (Institute of Electrical and Electronics Engineers) - Separable Insulated Connector Systems for Power Distribution Systems Above 600 V.
- I. NEMA 260 (National Electrical Manufacturers Association) - Safety Labels for Padmounted Switchgear and Transformers Sited in Public Areas.
- J. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment.

#### 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate electrical characteristics and connection requirements, outline dimensions, connection and support points, weight, specified ratings and materials.
- C. Product Data: Submit electrical characteristics and connection requirements, standard model design tests, and options.
- D. Test Reports: Indicate procedures and results for specified factory and field testing and inspection.

- E. Manufacturer's Field Reports: Indicate activities on site, adverse findings, and recommendations.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Section 01770 – Closeout Procedures: Closeout procedures.
- B. Project Record Documents: Include copy of manufacturer's certified drawings.
- C. Operation and Maintenance Data: Submit maintenance procedures for sampling and maintaining fluid.

#### 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years experience.
- B. Testing Agency: Company [member of International Electrical Testing Association and] specializing in testing products specified in this section with minimum three years experience.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01500 – Temporary Construction Facilities: Product storage and handling, storing, and protecting products.

#### 1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

#### 1.8 MAINTENANCE MATERIALS

- A. Furnish two each of special tools required to operate and maintain transformer.

#### 1.9 EXTRA MATERIALS

- A. Furnish two sets of each size and type fuse.

### PART 2 - PRODUCTS

#### 2.1 LIQUID-FILLED TRANSFORMERS

- A. Product Description: ANSI C57.12.26, single phase, pad mounted, self-cooled transformer unit.
- B. Cooling and Temperature Rise; IEEE C57.12.00; Class OA. 65 degrees C, self-cooled.
- C. Insulating Liquid: Oil conforming to IEEE C57.106.

#### 2.2 SERVICE CONDITIONS

- A. Meet requirements for usual service conditions described in IEEE C57.12.00

## 2.3 RATINGS

- A. Capacity: As shown on drawings.
- B. Primary Voltage: 7.2 kV Line-Neutral connected.
- C. Taps: Standard primary taps.
- D. Secondary Voltage: 240/120 volts, single phase.
- E. Impedance: 1.8 percent minimum.
- F. Basic Impulse Level: 95 kV.

## 2.4 ACCESSORIES

- A. Accessories: IEEE C57.12.00, standard accessories and the following:
  - 1. Oil drain.
  - 2. Filler and level plugs with automatic pressure relief device.
- B. Tap Changer: Externally-operated type.
- C. Primary Terminations: Bushing wells conforming to IEEE 386; furnish two for loop feed. Include bushings for insulated loadbreak connectors.
- D. Primary Overcurrent Protection: Canister-type current-limiting fuses to conforming to ANSI C37.47, sized at 150% of full load current.
- E. Secondary Terminations: Spade lugs.
- F. Other Accessories: Primary lightning arrestors.

## 2.5 FABRICATION

- A. Conform to requirements of ANSI C57.12.28.

## 2.6 FACTORY FINISHING

- A. Clean surfaces before applying paint.
- B. Apply corrosion-resisting primer to surfaces.
- C. Apply finish coat of baked enamel paint to 4 mils thick.
- D. Finish Color: Antique Linen, Federal Spec #23578.

## 2.7 SOURCE QUALITY CONTROL (AND TESTS)

- A. Provide factory tests conforming to IEEE C57.12.90. Include routine tests as defined in IEEE C57.12.00 and the following other tests:
  - 1. Impedance voltage and load loss.
  - 2. Dielectric tests.
  - 3. Audible sound level.

- 4. Short circuit capability.
- 5. Telephone influence factor (TIF).
- B. Test insulating liquid samples in accordance with IEEE C57.106.
- C. Make completed transformer available for inspection at manufacturer's factory prior to packaging for shipment. Notify Contracting Officer at least seven days before inspection is allowed.
- D. Allow witnessing of factory inspections and tests at manufacturer's test facility. Notify Contracting Officer at least seven days before inspections and tests are scheduled.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Verify pads and supports are suitable for installation.

#### 3.2 EXISTING WORK

- A. Disconnect and remove abandoned pad-mounted transformers. Cut abandoned raceway flush with surface of concrete pad.
- B. Clean and repair existing pad-mounted transformers to remain or to be reinstalled.

#### 3.3 INSTALLATION

- A. Install plumb and level on concrete pad.
- B. Install safety labels in accordance with NEMA 260.
- C. Install engraved plastic nameplates in accordance with Section 16050.
- D. Ground and bond transformer in accordance with Section 16050. Test grounding by three point fall-of-potential method.

#### 3.4 FIELD QUALITY CONTROL

- A. Section 01450 - Quality Control: Testing and inspection services.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.2. Include the following optional tests:
  - 1. Power factor or dissipation-factor tests.
  - 2. Winding-resistance tests for each winding at final tap setting.
  - 3. Individual excitation current tests on each phase.
  - 4. Insulating liquid specific gravity, power factor, water content, dissolved gas, and total combustible gas.
  - 5. Operational test and adjustments on fan and pump controls and alarm functions.
  - 6. Percent oxygen test on nitrogen gas blanket.

3.5 ADJUSTING

- A. Adjust primary taps so secondary voltage is within 2 percent of rated voltage.

END OF SECTION 16271

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## SECTION 16442 - PANELBOARDS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes branch circuit load centers.

#### 1.2 REFERENCES

- A. NECA (National Electrical Contractors Association) -Standard of Installation
- B. NEMA AB 1 (National Electrical Manufacturers Association) - Molded Case Circuit Breakers.
- C. NEMA PB 1 (National Electrical Manufacturers Association) - Panelboards.
- D. NEMA PB 1.1 (National Electrical Manufacturers Association) - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
- E. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems

#### 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.
- C. Product Data: Submit catalog data showing specified features of standard products.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Section 01780 - Closeout Submittals: Requirements for submittals.
- B. Project Record Documents: Record actual locations of panelboards and record actual circuiting arrangements.
- C. Operation and Maintenance Data: Submit spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

#### 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years experience.

#### 1.6 MAINTENANCE MATERIALS

- A. Furnish two of each panelboard key. Panelboards keyed alike to Government's current keying system.

## PART 2 - PRODUCTS

### 2.1 LOAD CENTERS

- A. Product Description: Circuit breaker load center, with bus ratings as indicated on Drawings.
- B. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical.
- C. Molded Case Circuit Breakers: NEMA AB 1, plug-on type thermal magnetic trip circuit breakers, with common trip handle for poles, listed as Type SWD for lighting circuits, Class A ground fault interrupter circuit breakers as indicated on Drawings. Do not use tandem circuit breakers.
- D. Enclosure: General Purpose.
- E. Box: Flush or Surface type as shown on drawings with door, and lock on door. Finish in manufacturer's standard gray enamel.
- F. Bus: Copper.

## PART 3 - EXECUTION

### 3.1 EXISTING WORK

- A. Disconnect abandoned load centers. Remove abandoned load centers.
- B. Maintain access to existing and load centers remaining active and requiring access. Modify installation or provide access panel.
- C. Clean and repair existing load centers to remain or to be reinstalled.

### 3.2 INSTALLATION

- A. Install load centers in accordance with NEMA PB 1.1 and NECA "Standard of Installation."
- B. Install and load centers plumb.
- C. Install recessed load centers flush with wall finishes.
- D. Height: 6 feet to top of load center.
- E. Install filler plates for unused spaces in load centers.
- F. Provide typed circuit directory for each branch circuit load center. Revise directory to reflect circuiting changes to balance phase loads.
- G. Install engraved plastic nameplates in accordance with Section 16050.
- H. Ground and bond panelboard enclosure according to Section 16050. Connect equipment ground bars of panels in accordance with NEC Article 517.

### 3.3 FIELD QUALITY CONTROL

- A. Section 01450 - Quality Control: Testing and Inspection Services.

- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform circuit breaker inspections and tests listed in NETA ATS, Section 7.6.
- D. Perform switch inspections and tests listed in NETA ATS, Section 7.5.
- E. Perform controller inspections and tests listed in NETA ATS, Section 7.16.1.

3.4 ADJUSTING

- A. Measure steady state load currents at each panelboard feeder; rearrange circuits in panelboard to balance phase loads to within 20 percent of each other.

END OF SECTION 16442

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## SECTION 16510 - INTERIOR LUMINAIRES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes interior luminaires, lamps, ballasts, and accessories.

#### 1.2 REFERENCES

- A. ANSI C82.1 - Ballasts for Fluorescent Lamps - Specifications.

#### 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate dimensions and components for each luminaire not standard product of manufacturer.
- C. Product Data: Submit dimensions, ratings, and performance data.

#### 1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

#### 1.5 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

#### 1.6 MAINTENANCE MATERIALS

- A. Furnish two of each plastic lens type.
- B. Furnish one replacement lamps for each lamp installed.
- C. Furnish two of each ballast type.

### PART 2 - PRODUCTS

#### 2.1 INTERIOR LUMINAIRES

- A. Product Description: Complete interior luminaire assemblies, with features, options, and accessories as scheduled.

#### 2.2 FLUORESCENT BALLASTS

- A. Product Description: Electronic ballast rapid start less than 10 percent THD, suitable for lamps specified, with voltage to match luminaire voltage.

2.3 INCANDESCENT LAMPS

- A. Manufacturers:
  - 1. General Electric Co.
  - 2. Osram-Sylvania.
  - 3. Philips Electronics North America] Model.
  - 4. Substitutions: Not Permitted.

2.4 FLUORESCENT LAMPS

- A. Manufacturers:
  - 1. General Electric Co.
  - 2. Osram-Sylvania.
  - 3. Philips Electronics North America] Model.
  - 4. Substitutions: Not Permitted.

PART 3 - EXECUTION

3.1 EXISTING WORK

- A. Disconnect and remove abandoned luminaires, lamps, and accessories.
- B. Extend existing interior luminaire installations using materials and methods as specified.
- C. Clean and repair existing interior luminaires to remain or to be reinstalled.

3.2 INSTALLATION

- A. Install suspended luminaires using pendants supported from swivel hangers. Install pendant length required to suspend luminaire at indicated height.
- B. Locate recessed ceiling luminaires as indicated on Drawings.
- C. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prevent movement.
- D. Install recessed luminaires to permit removal from below.
- E. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.
- F. Install clips to secure recessed grid-supported luminaires in place.
- G. Install wall-mounted luminaires at height as indicated on Drawings.
- H. Install accessories furnished with each luminaire.
- I. Connect luminaires to branch circuit outlets provided under Section 16130 as indicated on Drawings.
- J. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
- K. Install specified lamps in each luminaire.

- L. Ground and bond interior luminaires in accordance with Section 16050.

3.3 FIELD QUALITY CONTROL

- A. Section 0145 - Quality Control: Testing and inspection services.
- B. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.4 ADJUSTING

- A. Aim and adjust luminaires.

3.5 CLEANING

- A. Section 01780 - Closeout Submittals: Final cleaning.
- B. Remove dirt and debris from enclosures.
- C. Clean photometric control surfaces as recommended by manufacturer.
- D. Clean finishes and touch up damage.

3.6 PROTECTION OF FINISHED WORK

- A. Relamp luminaires having failed lamps at Substantial Completion.

END OF SECTION 16510

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## SECTION 16520 - EXTERIOR LUMINARIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes exterior luminaries, poles, and accessories.

#### 1.2 REFERENCES

- A. ANSI C82.4 - Ballasts for High-Intensity-Discharge and Low Pressure Sodium Lamps (Multiple-Supply Type).

#### 1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate dimensions and components for each luminaire not standard Product of manufacturer.
- C. Product Data: Submit dimensions, ratings, and performance data.

#### 1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01500 – Temporary Construction Facilities and Controls: Product storage and handling requirements.

#### 1.6 COORDINATION

- A. Section 01310 - Administrative Requirements: Coordination and project conditions.
- B. Furnish bolt templates and pole mounting accessories to installer of pole foundations.

#### 1.7 MAINTENANCE MATERIALS

- A. Furnish two of each lamp installed.
- B. Furnish two gallons of touch-up paint for each different painted finish and color.
- C. Furnish two ballasts of each lamp type installed.

### PART 2 - PRODUCTS

#### 2.1 LUMINAIRES

- A. Street Lighting Luminaires:
  - 1. Housing shall be fabricated from one-piece extruded aluminum with mitered corners that are internally welded and sealed. A press-formed aluminum top shall interlock with the housing

- and have a continuous seal of silicone rubber. Lid shall be peaked for strength and water runoff.
- 2. Reflector shall consist of a one-piece hydroformed reflector with specular alzac surface.
- 3. A mogul lamp socket shall be mounted in a one-piece casing, fully gasketed at the reflector surface.
- 4. Lens shall consist of a 3/16-inch thick impact-resistant clear tempered glass lens enclosed by a one-piece molded high temperature gasket. Lens and gasket shall interlock in an aluminum frame, which shall hinge at the pole end.
- 5. Luminaire shall be arm-mounted.
- 6. Provide photocell control for each luminaire.
- 7. Luminaire shall be equal in appearance and quality to the existing Kim EKG501 series luminaires used elsewhere on the base.

B. Sign Lighting Luminaire:

- 1. Stanchion-mounted 250-watt metal halide floodlight with medium flood pattern.
- 2. Housing: One-piece die-cast cylindrical shaped aluminum with integral cooling fins, 1/8 inch minimum wall thickness. One piece extruded and vulcanized silicone gasket between housing and door frame, concealed when fixture is closed. Concealed integral cast slip hinges with stainless steel pins.
- 3. Door Frame: One piece die-cast aluminum with integral cooling fins, 1/8 inch minimum wall thickness, mates with housing to create a continuous cylindrical shape. 3/16 inch thick tempered glass lens sealed to the lens frame by a one-piece molded silicone gasket.
- 4. Swivel: Heavy cast aluminum twin knob configuration with integral field-splice compartment, and mounts to a 2-inch pipe size tenon.
- 5. Luminaire shall be equal in appearance and quality to the existing Kim ALF23 luminaire with SM2 stanchion mount tenon used elsewhere on the base.

- C. Other Product Description: Complete exterior luminaire assemblies, with features, options, and accessories as scheduled.

## 2.2 HIGH INTENSITY DISCHARGE (HID) BALLASTS

- A. Product Description: ANSI C82.4, high pressure sodium lamp ballast, suitable for lamp and environmental conditions specified, with voltage to match luminaire voltage.

## 2.3 HID LAMPS

- A. Manufacturers:
- 1. Osram-Sylvania.
  - 2. Philips Electronic North America.
  - 3. General Electric Co.
  - 4. Substitutions: Not Permitted.

## 2.4 METAL POLES

- A. Material and Finish: Steel with prime finish for field painting.
- B. Section Shape and Dimensions: Tapered round.
- C. Height: As indicated on Drawings.
- D. Base: Nonbreakaway type.

- E. Accessories:
  - 1. Handhole.
  - 2. Anchor bolts.
- F. Loading Capacity Ratings:
  - 1. Luminaire Weight: As scheduled.
  - 2. Steady Wind: 80 miles per hour, minimum.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Section 01310 - Administrative Requirements: Coordination and Project conditions.
- B. Verify foundations are ready to receive fixtures.

#### 3.2 EXISTING WORK

- A. Disconnect and remove abandoned exterior luminaries.
- B. Extend existing exterior luminaire installations using materials and methods as specified.
- C. Clean and repair existing exterior luminaries to remain or to be reinstalled.

#### 3.3 INSTALLATION

- A. Install concrete bases for lighting poles at locations as indicated on Drawings, in accordance with Section 03300.
- B. Install poles plumb. Install double nuts to adjust plumb. Grout around each base.
- C. Install lamps in each luminaire.
- D. Bond and ground luminaries, metal accessories and metal poles in accordance with Section 16050. Install supplementary grounding electrode at each pole.

#### 3.4 FIELD QUALITY CONTROL

- A. Section 01450 - Quality Control: Testing and Inspection Services.
- B. Operate each luminaire after installation and connection. Inspect for improper connections and operation.
- C. Measure illumination levels.
- D. Take measurements during night sky, without moon or with heavy overcast clouds effectively obscuring moon.

#### 3.5 ADJUSTING

- A. Aim and adjust luminaries to provide illumination levels and distribution.

3.6 CLEANING

- A. Section 01710 – Closeout Procedures: Final cleaning.
- B. Clean photometric control surfaces as recommended by manufacturer.
- C. Clean finishes and touch up damage.

3.7 PROTECTION OF FINISHED WORK

- A. Relamp luminaires having failed lamps at Substantial Completion.

END OF SECTION 16520

## SECTION 16710 - COMMUNICATIONS CIRCUITS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes coordination and arrangements with the local Telecommunications and CATV Utility Companies for provisioning of telecommunication and CATV service distribution and building entrance service. The local utility companies will provide network interface devices (NID) as points of demarcation at each living unit. The Contractor shall provide interior terminating devices, outlets, premises wiring and accessories.

#### 1.2 REFERENCES

- A. TIA/EIA 568 – B.1 (Telecommunications Industries Association/Electronic Industries Association) - Commercial Building Telecommunications Cabling Standard Part 1: General Requirements
- B. TIA/EIA 568 – B.2 (Telecommunications Industries Association/Electronic Industries Association) - Commercial Building Telecommunications Cabling Standard Part 2: Balanced Twisted-Pair Cabling
- C. TIA/EIA 569 A (Telecommunications Industries Association/Electronic Industries Association) - Commercial Building Standard for Telecommunications Pathways and Spaces.
- D. Department of Defense (DOD) - Air Force Family Housing Guide.
- E. NFPA 72 – National Electrical Code (NEC)

#### 1.3 SYSTEM DESCRIPTION

- A. The Telecommunications and CATV Utility Companies shall provide telephone and CATV service distribution, building entrance, and network interface devices.
- B. The local Telecommunications Utility Company is Qwest.
  - 1. Contact: Butch Preston, OSP Engineer, 406-771-2533
  - 2. Contact: Mike Kilorn, Cable Maintenance Foreman, 406-771-2585
- C. The local CATV Utility Company is AT&T Broadband.
  - 1. Contact: Henry Woloszyn, OSP Engineer, 406-727-8881
  - 2. Contact: Paul Gay, Construction Mgr., 406-727-8881
- D. Service Entrance Pathway: Empty raceway from point of connection to Telephone and CATV Utility provided pedestals to the building entrance service NIDs, point of demarcation.
- E. Entrance Wiring: By Telephone and CATV Utility Companies.
- F. Horizontal Pathway: Comply to TIA/EIA 569-A and 570-A, using concealed pathways and/or raceway as required.
- G. Horizontal Wiring: Provide home runs from each utility's respective NID to each outlet, using unshielded and coaxial horizontal cables.
  - 1. Telecommunications: 4-pair, Category 5, unshielded twisted pair (UTP), UL Listed as required in the NEC as suitable for use in residential housing.

- 2. CATV: Coaxial cable UL Listed as required in the NEC as suitable for use in residential housing.

- H. Outlet Devices And Faceplates: Provide outlet devices at locations indicated on contract document drawings.

#### 1.4 SUBMITTALS

- A. Comply with requirements of Section 01330 – Submittal Procedures.
- B. Product Data: Submit catalog data for each termination device, cable, faceplate and outlet device.
- C. Test Reports: Document and provide procedures and results for specified field-testing and inspection.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Comply with requirements of Section 01780 – Closeout Submittals.
- B. Project Record Documents: Record and submit actual locations, quantities, and sizes of outlet devices.

#### 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years experience.
- B. Installer: Company specializing in installing products specified in this section with minimum five years experience.
- C. Testing Agency: Company specializing in testing products specified in this section with minimum five years experience.

### PART 2 - PRODUCTS

#### 2.1 TELEPHONE/CATV PULL BOX ENCLOSURE

- A. NEMA Type 3/3R enclosure, 12-inches by 12-inches by 6-inches with removable cover. Provide knockouts in the field.
- B. Acceptable Manufacturer:
  - 1. Circle AW Part No. 12126 RTSC NK.
  - 2. Or approved equivalent.

#### 2.2 OUTLET DEVICES AND FACEPLATES

- A. General:
  - 1. Provide angled down outlet connection devices for both telephone and CATV.
  - 2. Combine both telephone and CATV outlet connection devices in a common faceplate. Exception: where Drawings indicate a wall mounted telephone location. Provide a wall mount stainless steel faceplate for the phone and a separate outlet box and faceplate for the CATV.
  - 3. Provide all faceplates of a type that will accommodate from one (1) to six (6) outlet connecting devices of both telephone and CATV within one faceplate.

- B. Telephone:
  - 1. Provide one 8-position, 8-pin, angled down, Category 5, outlet connector jack color electrical ivory to match electrical cover plates.
  - 2. Wire all outlet connector jacks to TIA/EIA Standard T568A pin-out.
  - 3. Acceptable manufacturers:
    - a. AVAYA Communications.
    - b. NORDX/CDT.
    - c. Siemon.
    - d. Or approved equivalent.
  
- C. Telephone (wall mounted):
  - 1. Provide one 8-position, 8-pin, outlet connector jack in a stainless steel faceplate equipped with two, wall telephone, slotted, mounting posts.
  - 2. Provide at locations indicated on the Drawings.
  - 3. Wire the outlet connector jack to TIA/EIA Standard T568A pin-out.
  - 4. Typical part number is 630B-8.
  - 5. Acceptable manufacturers:
    - a. AVAYA Communications.
    - b. AllenTel.
    - c. Or approved equivalent.
  
- D. CATV:
  - 1. Provide one "F" type, angled down, coaxial coupler (barrel) connector device for each TV location indicated on drawings.
  - 2. Match CATV faceplate color to that of telephone and electrical cover plates, electrical ivory.
  - 3. Acceptable manufacturers:
    - a. AVAYA Communications.
    - b. NORDX/CDT.
    - c. Siemon.
    - d. Or approved equivalent.

## 2.3 COAXIAL CABLE CONNECTORS

- A. Provide an "F" type, male, connector for each CATV drop at the outlet end.
- B. Connect the coaxial cable to the outlet device using the "F" type connector provided.

## 2.4 HORIZONTAL CABLE

- A. Telephone:
  - 1. Provide UL Listed Category 5, unshielded twisted pair (UTP), 100-ohm, 24 AWG copper, 4-pair cable home run for each telephone outlet indicated on the drawings.
  - 2. Comply with TIA/EIA Standards 568-A, 569-A, 570-A, and the NEC.
  - 3. Acceptable manufacturers:
    - a. AVAYA Communications.
    - b. NORDX/CDT.
    - c. CommScope
    - d. Berk-Tek
    - e. Or approved equivalent.
  
- B. CATV:
  - 1. Provide UL Listed RG6, 75 ohm, coaxial cable home run for each TV outlet indicated on the drawings.

2. Comply with TIA/EIA Standards 568-A, 569-A, 570-A, and the NEC.
3. Acceptable manufacturers:
  - a. Belden.
  - b. CommScope
  - c. Berk-Tek
  - d. Or approved equivalent.

### PART 3 - EXECUTION

#### 3.1 EXISTING WORK

- A. Coordinate demolition of all telecommunications and CATV cable and equipment with the local utilities, Qwest and AT&T Broadband, and the Base Communications Squadron.
- B. Remove exposed and concealed abandoned telecommunications and CATV cables and pathways.
- C. Disconnect and remove abandoned telecommunications and CATV equipment.
- D. Return any removed telecommunications and CATV equipment that is the property of Qwest or AT&T Broadband to the respective utility company.
- E. Return any salvaged telecommunications and CATV equipment to the Base Communications Squadron as directed.

#### 3.2 INSTALLATION

- A. Provide pathways in accordance with TIA/EIA Standards 569-A, 570-A, and the NEC.
- B. Provide wire and cable in accordance with TIA/EIA Standards 568-B.1 and B.2, 570-A, and the NEC.
- C. Provide outlet boxes, mud rings, and enclosures plumb and level, and attach securely to building structure.
- D. Install recessed boxes and mud rings flush with wall finishes.
- E. Install polyethylene pulling string in each empty telephone and CATV utility conduit over 10-feet in length or containing any bends.
- F. Provide "F" type connectors at the outlet end of all coaxial cables and connect to the faceplate coax coupler (barrel) connector.
- G. Terminate 4-pair UTP cables to the telecommunications outlet connector jacks using TIA/EIA Standard T568A pin-out.
- H. Home run all telecommunications and CATV cables from their outlet location to the demarcation point of connection provided by Qwest and AT&T Broadband. Coordinate with the both utilities for location and the amount of excess cable to leave at the demarcation point of connection.
- I. Direct Qwest to connect all telecommunications cables at the NID in the following manner:
  1. Connect the blue-white pair to the first pair in the buried service wire provided by Qwest.
  2. Connect the orange-white pair to the second pair in the buried service wire provided by Qwest.

- 3. Connect all horizontal cables at the NID so the tenant can plug a phone into any outlet and that outlet will be activated.
  - J. Direct AT&T Broadband to connect all CATV cables at the point of demarcation so that all horizontal cables will be active at their respective CATV outlet.
- 3.3 FIELD QUALITY CONTROL
- A. AT&T Broadband is responsible for the proper signal level at the outlet connector device where the tenant's receiver is connected.
  - B. Test 4-pair copper cables in accordance with TIA/EIA 568-A Standards for Category 5 for the permanent link test. Provide documented results to the Base Communications Squadron for approval.
  - C. Repair to the Base Communications Squadron's satisfaction any wire runs that fail the permanent link test or otherwise deemed non-compliant.

END OF SECTION 16710

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## SECTION 16722 – RESIDENTIAL SMOKE AND CARBON MONOXIDE/GAS DETECTORS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes residential smoke detectors that are to be installed in sleeping rooms, corridors and living areas.
- B. Section includes residential carbon monoxide and explosive gas detectors to be installed near the furnace and on all floor levels.

#### 1.2 REFERENCES

- A. National Fire Protection Association (NFPA) - NFPA 70, National Electrical Code (NEC), 1999 Edition.
- B. National Fire Protection Association (NFPA) - NFPA 72, National Fire Alarm Code, 1999 Edition.
- C. Underwriters Laboratories (UL) – UL 2034, Single and Multiple Station Carbon Monoxide Alarms.

#### 1.3 SYSTEM DESCRIPTION

- A. Single station smoke detectors shall be hardwired to 120 VAC circuits and looped together such that any detector in alarm shall cause all detectors to signal an alarm. The detectors shall be photoelectric style and located as indicated in the contract documents.
- B. Single station carbon monoxide detectors shall be hardwired to 120 VAC circuits and located as indicated in the contract documents.

#### 1.4 SUBMITTALS

- A. Comply with requirements of Section 01330 – Submittal Procedures.
- B. Product Data: Submit catalog data for each type detector.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Comply with requirements of Section 01780 – Closeout Submittals.
- B. Project Record Documents: Record and submit actual detector locations and circuits wired to.

### PART 2 - PRODUCTS

#### 2.1 DETECTORS

- A. Smoke detectors shall be hardwired to a 120VAC dedicated circuit and be equipped with a 9-volt battery backup. Detectors shall be capable of interconnecting with a minimum 18 similar devices by interconnecting wiring. When interconnected with additional devices, all units shall sound an alarm upon activation of any single detector. Detector shall provide visible indication that the device is active and which device is in alarm and be equipped with a test button.
  - 1. Acceptable manufacturer is Kidde.
  - 2. Or approved equivalent.

- B. Carbon monoxide detector shall be a combination carbon monoxide and explosive gas detector with a digital readout and 85-dB horn output and have hard wire capability. It shall be equipped with a 9-volt battery backup.
  - 1. Acceptable manufacturer is Kidde/NightHawk.
  - 2. Or approved equivalent.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Detectors shall have a dedicated 120V circuit.
- B. Smoke detectors shall have interconnecting wiring to interconnect all devices. All devices sound on any single alarm. Install all devices and wire according to manufacturer's recommendations.
- C. Carbon monoxide explosive gas detector shall be hard wired to a 120V circuit and located in an easily accessible and visible location.

#### 3.2 TESTS

- A. System hookup and test is to be accomplished by the contractor in the presence of the Base Fire Marshall. The contractor shall furnish a letter to the contracting officer certifying that the system is installed properly and is complete and operating as specified and the Base Fire Marshall has approved testing.

END OF SECTION 16722